

*N. H. ...*

# THE **C**ONDOR

A Magazine of Western  
Ornithology



Volume XXXIII

May-June, 1931

Number 3



COOPER ORNITHOLOGICAL CLUB

# THE CONDOR

A Magazine of Western Ornithology

Published Bi-monthly by the Cooper Ornithological Club

Entered as second-class matter May 15, 1925, at the post-office at Berkeley, California,  
under Act of Congress of February 28, 1925, Section 412, paragraph 4.

Issued from the Office of THE CONDOR, Museum of Vertebrate Zoology, Berkeley, California.

## SUBSCRIPTION RATES

Three Dollars per Year in the United States, payable in advance.

Fifty Cents the single copy.

Three Dollars and Twenty-five Cents per Year in all other countries in the International Postal Union.

## COOPER ORNITHOLOGICAL CLUB

Dues are payable in advance on January first for the calendar year: Three Dollars per year for members residing in the United States; Three Dollars and Twenty-five Cents in all other countries. Members whose dues are paid receive THE CONDOR without additional charge.

Send manuscripts for publication to the Editor, J. GRINNELL, Museum of Vertebrate Zoology, University of California, Berkeley, or to the Associate Editor, JEAN M. LINSDALE, same address.

Send dues and subscriptions to JOHN McB. ROBERTSON, Associate Business Manager, Buena Park, California; orders for back numbers of THE CONDOR and the PACIFIC COAST AVIFAUNA series to W. LEE CHAMBERS, Business Manager, 2068 Escarpa Drive, Eagle Rock, California.

---

Issued May 15, 1931

---

## CONTENTS

|  |                     |     |
|--|---------------------|-----|
| Notes on the Habits and Development of Young Quail.....  | Frank F. Gander     | 85  |
| Some Observations on Bird Behavior (with two illustrations).....   | E. L. Sumner, Jr.   | 89  |
| Facts Concerning the Use of Thallium in California to Poison Rodents—Its Destructiveness to Game Birds, Song Birds and Other Valuable Wild Life (with one illustration)..... | Jean M. Linsdale    | 92  |
| Two Primitive Rails from the Eocene of Colorado and Wyoming (with nine illustrations).....   | Alexander Wetmore   | 107 |
| The Birds of the Rogue River Valley, Oregon.....   | Ira N. Gabrielson   | 110 |
| FROM FIELD AND STUDY   |                     |     |
| Late Nesting of a Pair of Barn Swallows in Montana.....  | Winton Weydemeyer   | 122 |
| An Experiment in Staining California Gulls.....  | John B. Price       | 123 |
| Black-necked Stilts Nesting in the Suisun Marshes, California.....   | Emerson A. Stoner   | 123 |
| Eastern Fox Sparrow Trapped in Berkeley, California.....   | E. L. Sumner, Sr.   | 124 |
| Ground Nesting of Crows in Wyoming (with one illustration).....  | Captain L. R. Wolfe | 124 |
| The Reddish Egret, a Bird New to the Avifauna of California.....   | Lawrence M. Huey    | 125 |
| A Seasonal Feast of the Willow Goldfinch.....  | Tracy I. Storer     | 125 |
| Behavior of Parent Killdeer.....   | Henry Warrington    | 126 |
| Whistling Swans on Salton Sea.....   | Wilson C. Hanna     | 126 |
| Harris Sparrow in Berkeley.....  | Margaret W. Wythe   | 127 |
| Two New Birds and Other Records for Lower California, Mexico.....  | Lawrence M. Huey    | 127 |
| Some Banded Birds Recaptured after Five to Seven and One-half Years.....   | E. L. Sumner, Sr.   | 128 |
| Some Recent Records from Lincoln County, Montana.....  | Winton Weydemeyer   | 128 |
| The Western Tanager Wintering in Southern California.....  | E. S. Spaulding     | 129 |
| The Most Western Record of the Indigo Bunting.....   | Lawrence M. Huey    | 129 |
| EDITORIAL NOTES AND NEWS.....  |                     |     |
| Wholesale Poisoning of Wild Animal Life.....   | J. Grinnell         | 131 |
| PUBLICATIONS REVIEWED:   |                     |     |
| Bannerman's Birds of Tropical West Africa.....   | J. Grinnell         | 132 |
| MINUTES OF COOPER CLUB MEETINGS.....   |                     |     |
|  |                     | 134 |







# THE CONDOR

A BI-MONTHLY MAGAZINE OF  
WESTERN ORNITHOLOGY

Published by the  
COOPER ORNITHOLOGICAL CLUB

---

VOLUME XXXIII

MAY-JUNE, 1931

NUMBER 3

---

## NOTES ON THE HABITS AND DEVELOPMENT OF YOUNG QUAIL

By FRANK F. GANDER

By chance, during the summer of 1930, I had an excellent opportunity to study young Valley California Quail (*Lophortyx californica californica*), but due to pressure of other duties was unable to take full advantage of it. However, some of my notes seem worthy of record, since I find almost nothing in the literature which deals with the development of these birds.

On June 15, while burning grass in my yard, which is on a cañon side and adjacent to thick chaparral, a quail's nest was discovered which contained 20 eggs. The bird flew from the nest only when the fire had burned to its very edge; while I immediately put out the flames, some of her protecting cover had already been burned. The nest was typical, being a shallow depression in the ground, very lightly lined with dry grass and roofed over with dry grass and golden tarweed. One of the eggs was so finely and evenly speckled with dark brown as to appear solidly colored. The quail returned to her nest and was observed on it numerous times, even when children were playing quite near, or when big-footed Muscovy ducks waddled haphazardly past her.

On July 2, at about 6:30 p. m., the quail's nest was inspected and found to be deserted and the eggs cold. Many of the eggs were pipped and in some I could see that the chick was still alive, although ants had been feeding on them. Two eggs were smashed, including the brown one. The remainder were taken to the house and placed in a pan of warm water where they at once began to bob around and I could hear a faint peeping sound. When to this was added the cracking of shells, the eggs were hurriedly removed from the water and placed in a nest of warm flannel. The chicks quieted down and there was no more cracking of the shells after about 7:30. About 8 they were given another warm bath and, as before, they bobbed around, but there was no cracking of the shell and much less peeping. They were left in the bath this time only long enough to permit of arranging their nest on a hot water bottle before returning them to it. Twice during the night, fresh hot water was put in the water bottle, but the little birds remained quiet.

Between 6 and 6:30 a. m. the water was again changed and in a short time activity began. By 7 o'clock five had hatched, three were almost out and others

were busily chipping the shells. Hatching was a rapid process. Most of the eggs had been pipped the night before and remained in this condition until morning. With the resumption of activity at dawn, with much peeping, the chick would turn in the shell, breaking a ring about the larger end as it did so. When this had progressed about three-fourths of the way around there would be a short rest period of a few seconds. Then, accompanied by a loud cheep, the top would fly open like a lid. The little bird would draw its head forth from under its wing and, with much kicking, squirming and peeping, would succeed in extricating itself from the remainder of the shell. By noon, 13 had hatched and there were no more after this, although all of the eggs were fertile.

Since there was no change in the method of caring for the eggs, the long rest period from 7:30 p. m. to 6:30 a. m. was seemingly due to the fact that this is the natural rest time of quail and the little birds were presumably sleeping. This is in keeping with observations that have been made on domestic pigeons. (See Whitman, Charles Otis: *The Behavior of Pigeons*, Publ. Carnegie Inst. Wash., no. 257, vol. 3, 1919.) It is interesting to note within how short a time the hatching of the brood was completed.

Female quail feathers discovered in the yard of a neighbor on the morning of July 1 were presumably from the missing owner of the nest, which had perhaps furnished a meal for someone's pet cat. This would indicate that the eggs had been exposed from some time previous to the finding of the feathers on the morning of July 1 until the evening of the second. It seems remarkable that any of the chicks were alive after the two days exposure to the July sun. Some of them were noticeably weakened.

On the morning of the 4th the little quail were given finely chopped yolk of hard-boiled egg, which they picked at rather casually after I had aroused their interest in it by tapping with my forefinger. In mid-morning they were placed in a cage out-of-doors in the sunshine. Live insects were dropped in their cage and they caught and eagerly devoured them. Anything that moved was looked upon as food and they ate flies, bugs, ants, tree hoppers, a wasp, small caterpillars, spiders, grasshoppers, etc., without discrimination except as to size and hardness. Large specimens were torn into small fragments which the quail seized eagerly. Whenever one secured a morsel too large to be swallowed readily, it ran wildly about the cage to prevent others from snatching the food from its beak. One little bird was seen to scratch in the sand of the cage floor, but rather awkwardly and ineffectually. Ants invaded the cage during the day and distressed the baby quail greatly by biting them on the toes. The cage was moved to a clean spot, but the birds had learned to fear the tiny biting insects and made no attempts to eat them from this time on.

Due to lack of time and of equipment for properly caring for the little orphans the mortality rate was high. By July 13, there were but 8 left. One of these was conspicuously larger than the others and a second was very long-legged. Wing feathers reached clear to the tail on the larger birds and pinfeathers were showing in tail and on shoulders. They were turned loose in the yard and followed me as I searched for food for them. They soon responded to my call of "chick, chick", with which I attracted their attention to insects I had found. Not only all insects offered were eagerly eaten, but also spiders and even the little isopods known as sow-bugs. They also found much food for themselves, and their crops were well filled when I returned them to their cage. For the next 10 days they were taken out for walks about the yard two or three times daily by either my small son or

myself. It was noted that they usually started the morning by eating much sand or earth, and whenever during the day they came to freshly turned clay or other inorganic soil they ate it quite greedily. They were now finding most of their food by themselves, but they continued to eat some of the chopped egg; and during this period they began to show a fondness for bread crumbs and chick mash.

After about July 24 the little quail were given the run of the place and wandered widely over the yard and through the neighboring chaparral. They always returned to their cage at dusk and, as their wings developed, soon came flying whenever called. On the evening of July 31 one was heard to attempt the three-note call of the adult male. On the following morning they were heard giving the "conversational" notes of feeding adult birds, instead of the peeping which they had used theretofore. They were seen feeding extensively on sand spurry and moss at this time, even though the latter was dry and crisp.

By August 8, they were becoming quite well feathered, but the head was still largely down-covered. Some feathers were showing over the ears, in front of the topknot and on the neck. The long-legged bird was much more richly colored than most of the others, although one other approached it in shade. The largest bird was lighter in color, as were the two smaller ones. The two darker birds proved to be males, the largest light one a female; but the two little ones never reached a stage of development where I was sure of their sex. It was not until about August 20 that the sex of the larger birds could be definitely and readily determined, through their resemblance to adults.

After August 21, they roosted in shrubbery near the house. Due to depredations by predators, by the 24th of the month but 3 were left, the large female and the two males. It had been noted for some time that they were feeding less and less on insects and more and more on plant food, being especially fond of the clover in our lawn and also of the dry moss which grows under the greasewood. Some experiments were made with insect food. A small measuring worm was offered the female, but while she pecked at it she did not eat it. She looked at a robber fly but did not move towards it; she ate one small grasshopper and ignored another. A month earlier, any of these insects would have been fought over. All 3 were seen eating chinch bugs, and they also eagerly devoured flies which were swatted for them about the house.

The quail were now becoming of good size and were growing fond of grain which was supplied to them on top of a barrel near the chicken run. Whenever called, they would come flying to this barrel to be fed. During the latter part of August two more disappeared, so that only the largest and darkest-colored male remained. He developed a very interesting plumage which, apparently, was a true post-juvenile plumage and was worn all during the month of September. The back, wings and neck were gray; the facial mask was a darker gray and was distinctly bounded by a narrow band of grayish white; the breast and belly were gray with a median stripe of chestnut on the lower part; the sides and flanks were marked as in the adult bird. The top-knot worn with this plumage was like that of the adult female. A few scattered feathers of the adult plumage appeared, but their number did not increase during the month. About October 1 the top-knot was shed and at the same time a plumage resembling that of the adult began to appear. A new top-knot was grown and the bird was in good feather by the middle of the month.

With the disappearance of its companions, this last bird became more and more attached to its human associates and would follow any member of the family who

appeared in the yard. As time went on, he began to spend more and more time in the chaparral and soon was running with the wild birds. He would come daily to feed from our hands until about the end of the month, when he began to grow more timid and would not come near. By the beginning of the open season we had lost contact with our former pet, but often a fine male quail would come out of the chaparral at the foot of the yard and call to us. If we attempted to come near, however, he would retreat into the brush.

Summary: Thirteen little quail were successfully hatched from 18 eggs after these had been exposed in an open nest for a period probably exceeding 36 hours.

None of the little chicks hatched out between 7:30 p. m. and 6:30 a. m., although several had pipped the shell some little time previous to this, and others were active and chipping the shell about 7:00 p. m.

The newly hatched quail showed a decided preference for insect food and it was not until after about three weeks that this taste began to wane; by August 24, when 52 days old, they were feeding largely on plant food and one bird refused to eat some kinds of insects previously taken.

Sexual characteristics of the plumage, resembling adults, were not distinguishable until August 20, when the birds were about seven weeks old.

The sole surviving male bird developed a distinct post-juvenile plumage at the age of about two months and wore same for about one month. This was followed by a plumage practically like that of the adult.

*San Diego Society of Natural History, San Diego, California, February 12, 1931.*

## SOME OBSERVATIONS ON BIRD BEHAVIOR

WITH TWO ILLUSTRATIONS

By E. L. SUMNER, JR.

During the summer of 1930, while engaged in a survey of animal populations on the State Duck Refuge recently established in the San Joaquin Valley near Los Baños, Merced County, California, I observed several noteworthy examples of bird behavior. Although incomplete, notes such as these may nevertheless have some value for the reason that animal life histories reveal themselves only gradually and in scattered fragments, so that a picture of the whole can soonest be formed by small but relatively numerous contributions.

**Play Reaction of a Marsh Hawk (*Circus hudsonius*).** July 19: An individual in the brown plumage was seen flying over the flats on the south side of the refuge, carrying a horned lark (*Otocoris alpestris actia*), and the subsequent behavior of the hawk was watched through 12-power glasses. All at once the hawk dropped the lark, whereupon the latter, still alive, flew weakly to the ground about seven feet away, its captor with outstretched talons hovering meanwhile about two and one-half feet above it but not pouncing upon it. When the lark reached the ground, the hawk lit beside it, then gave a little jump into the air and landed with spread talons upon its prey. It seemed not to bite the lark, but after examining it with many twistings and turnings of the head rose about three feet into the air with it, and then dropped it again, the lark still fluttering, and pounced upon it just as before. This the marsh hawk did seven or eight times, and I marveled at the clumsiness of the bird until I realized what was going on—it was playing.

At length the lark fluttered into a tangle of shrubby weeds, which circumstance seemed to furnish even more interest for the hawk. It would prance about in the weeds, taking great high steps, and now and again bend down to peer intently in at the lark. I do not think the hawk at any time really lost its prey. This continued for about ten minutes from the time when I had started to watch, after which the bird settled in a little depression with its victim and was then out of sight.

Five minutes later I walked over toward the spot. At 100 feet the hawk became visible, standing in a flat, open place, feeding. It saw me, rose empty footed, and made straight past me, circled around me at a distance of about *thirty feet*, and then made off in the same direction from which it had started, circling and flapping in leisurely fashion. The lark was all eaten, except for some wing and tail feathers, the gizzard, a piece of liver, and a fragment of intestine.

There were four or five ground squirrels (*Otospermophilus grammurus beecheyi*) sitting by their burrows, one of them only 50 feet from the feeding hawk, and yet none of them at any time showed concern over its movements.

The interpretation of the reactions of the marsh hawk as play seems justified in the light of previous observations on young hawks and owls which I have raised in the laboratory and which regularly exhibited just this sort of behavior in the presence of either real or mock prey.

**Escape Reactions of a Young Black-necked Stilt (*Himantopus mexicanus*) in Water.** July 31: North end of Ruth Lake, on the Los Baños Duck Refuge. Two youngsters about one-third grown (fully fledged) were observed on a muddy shore. One of them was caught, but the other escaped temporarily by wading out into deep water and then swimming. It moved rapidly and easily on the water, bobbing its head energetically. When I approached within three feet, it dived from the surface,

remaining under for one or two seconds, and came up about  $3\frac{1}{2}$  feet away. In swimming under water, it flapped its wings strongly, both together, as well as kicking its legs, although making little speed. It eluded me about four times in this manner before being captured. At no time, however, did it descend more than six or eight inches below the surface.

A. C. Bent (*Life Histories, Limicolae, I*, 1927, p. 52) mentions that adult stilts can swim, and even dive if necessary, although awkwardly and only in cases of dire necessity, but he makes no statement as to wing action or the occurrence of this escape reaction in birds too young to fly.

Some Reactions to Intrusion of a Nesting Texas Night Hawk (*Chordeiles acutipennis texensis*). July 25: Alkali flat sparsely covered with alkali blite (*Suaeda moquini*). Female flushed from two young at twenty feet and flopped about on

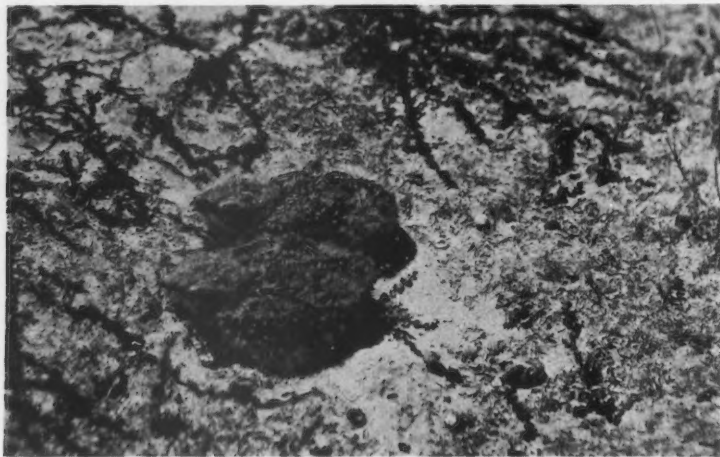


Fig. 18. "NEST" SITE AND YOUNG OF TEXAS NIGHTHAWK, IN ALKALI PLAINS TYPE OF COUNTRY, LOS BAÑOS DUCK REFUGE, MERCED COUNTY, CALIFORNIA. YOUNG ARE PARTIALLY SHADED BY BUSH OF "ALKALI BLITE." PHOTOGRAPHED JULY 25, 1930.

the ground with outstretched wings, feigning injury. "Nest" is a slight depression located at the base of a tough straggling *Suaeda* plant (fig. 18), so that the youngsters are partially shaded; the ground is smooth, unbroken, and devoid of feathers, with a few feces in a circle about the young.

July 26, 10:30 a. m.: Youngsters have been moved and are under another *Suaeda* plant fifteen feet away; the two are together, as before, and neither seemingly capable of moving by its own exertions. It looks as if the parent must have moved them. I placed the camera four feet from the young and went away for one and one-half hours. The female had not returned when I came back, although the sun was hot on the young.

Two hours later: The young had been moved again, about ten feet to another *Suaeda* plant. The adult, after fluttering awhile on the ground, flew to a fence 100 feet distant and perched crosswise on a strand of barbed wire. Here she stayed



for more than fifteen minutes, although totally unprotected from the wind, which was blowing so hard that she bobbed up and down and her feathers were much ruffled. Finally she flew back toward the nest and settled on the ground out of sight of me. One hour later she was still not on the nest, although the young had been forced to crawl into the middle of their shelter to avoid the sun.

In order to prevent the parent from again moving the young, I tied them



Fig. 19. ADULT TEXAS NIGHTHAWK AND YOUNG AFTER SECOND SHIFT OF HOME SITE CAUSED BY DISTURBANCE. THE HEAD OF THE SECOND YOUNGSTER IS HIDDEN BENEATH THE BROODING ADULT. PHOTOGRAPHED JULY 27, 1930.

with threads to the *Suaeda* and left the camera in place over night. By this means the old bird was at last persuaded to accept its presence, and on the following morning was in position at the nest for a picture (fig. 19).

An accident, leading to exposure of the young to the direct rays of a noon sun, with fatal results, brought my observations to a close on the following day.

*Museum of Vertebrate Zoology, Berkeley, California, January 29, 1931.*

FACTS CONCERNING THE USE OF THALLIUM IN CALIFORNIA  
TO POISON RODENTS—ITS DESTRUCTIVENESS TO  
GAME BIRDS, SONG BIRDS AND OTHER  
VALUABLE WILD LIFE

WITH ONE ILLUSTRATION

By JEAN M. LINSDALE

For the past four years extraordinary efforts have been put forth in California to reduce the number of ground squirrels. Any observant person who spends much time in the portions of the state where these efforts at control have been most active (see fig. 20), cannot fail to learn that squirrel poisoning is one of the most heatedly discussed subjects connected with the out-of-doors. My own interest in this problem was aroused after visits to many of the localities concerned had demonstrated to me that the situation has developed into a really serious one—even more serious than the most partisan protestors have realized.

Much enquiry has convinced me that the present unfortunate conditions have resulted first, from introduction and widespread adoption in this state of thallium as a squirrel poison, and, second, from prosecution of control campaigns with too great vigor. The evidence now available forcibly points to the conclusion that efforts to regulate numbers of ground squirrels can be, and, in some localities, have been, carried to an extreme where the results cause more damage than benefit to the agricultural interests themselves.

Thallium, the metallic element which plays such an important part in the recent revival of interest in squirrel poisoning, was discovered by Crookes in 1861. At about the same time it was isolated and its properties were determined by Lamy. The metal itself is bluish-white and lead-like, and it is insoluble in water. It occurs in pyrites and is found in the flue dust of sulphuric acid works and is prepared by heating thallium iodide with metallic sodium. Although rather widespread in natural occurrence, the whole amount available for use is relatively small.

For the purposes now being considered, thallium salts are used. Of these, thallium acetate has been used for medical purposes and thallium sulphate in rodent poisons. Following its early use, about the end of the last century, to check sweating, its action in causing the loosening and falling out of hair was noted. Most of the information about its poisonous effects in man has been obtained as a result of its use as a hair remover in the treatment of ringworm of the scalp. Hundreds of children have been treated, especially in Mexico and Russia, where this affliction is prevalent. Most, if not all, mammals lose their hair after eating thallium. This is an especially unfortunate feature as regards fur-bearing mammals, which, even if they do not die from eating thallium, are made useless for fur by getting small amounts of it into their systems.

In addition to the knowledge that has accumulated from the therapeutic use of thallium, several workers have made experiments with it upon various laboratory animals. Swain and Bateman concluded, after extensive tests, that thallium deserves to be classed among the most poisonous of the elements and that it progresses in its physiological action with remarkable certainty and definiteness. They demonstrated that it is much more poisonous than lead but ranks close to arsenic, from which, however, it differs in several respects which make it even more dangerous.

The effectiveness of thallium as a rodent poison was tested by Munch (1928). He found that the poisoned baits were consumed with the same eagerness as control



food containing no thallium. The amount of bait offered was one-half to one per cent of the body weight of each animal. In most instances this amount of food was eaten within 15 to 30 minutes after exposure. Twenty-five milligrams of thallium per kilogram of body weight of the rodent was determined as the minimum lethal dose. This amount killed all or nearly all the test animals within five days. One



Fig. 20. SHOWING PORTION OF CALIFORNIA AFFECTED BY THALLIUM. THE HEAVY BLACK LINE SURROUNDS THOSE COUNTIES IN WHICH "GROUND SQUIRREL CONTROL" HAS BEEN MOST ACTIVE AND IN WHICH THALLIUM-POISONED GRAIN HAS BEEN SCATTERED.

gram of thallium was contained in each 1.24 grams of the thallium sulphate used. Munch found that death usually occurred on the second or third day after the baits were eaten, unless the quantity of poison eaten was excessive. Ten times the minimum lethal dose killed only one rat of five within one day. Forty times the minimum lethal dose killed only four out of five rats in one day.

Disorders of the nervous system are among the first effects of this poison noticed in animals that have absorbed it. These appear first as a lack of coordination in locomotion and are localized in the hind quarters which gradually become paralyzed. Lynch, Lond and Scovell recently pointed out that it has a definitely selective action on all forms of nervous tissue, and it has been demonstrated that, even in infinitesimal doses, it causes slight degenerative changes in the brain cells of rats. They conclude that it is "most unlikely to leave the human brain entirely unchanged." This last work available (published in December, 1930) shows that "the far-reaching effects of the poison are much greater than is generally supposed."

An instance is cited of a girl who used "on her face a cream for superfluous hairs which contained 2.5 per cent. thallium. Six months later she was still paralyzed and the hair had not regrown. It is probable that sufficient of the cream had been swallowed to produce the symptoms." It has been rather definitely shown that thallium must be absorbed to affect an animal; when applied externally it has no effect. However, there are recent records of workmen, in chemical works where thallium is isolated, getting sufficient amounts of it into their systems to cause serious poisoning.

Animals poisoned with thallium, that have been examined after death, showed the metal to be present in almost every tissue of the body, with less in the skin than any other tissue. This provides a way for certain poisoning of any carnivore which happens to feed upon the carcass of an animal that has died from this poison. Another important aspect of thallium is that it is cumulative in its action. That is, small amounts taken at intervals, unless these intervals are several months apart, will have the same effect as one dose equal to the whole amount taken. In the case of human beings, these small doses are not eliminated for more than ten weeks. According to Deyane the poison is gradually excreted by the kidneys, and those organs are especially liable to injury by it.

One experimenter (Ehrhardt, 1927, p. 1374) fed large doses of thallium to a mother rat for four days, when the rat died. The young rats were then transferred to another rat and fed with her milk, but they showed the effects of thallium poisoning.

Unlike many poisons this one appears not to warn, as by a bitter taste, the animal eating it, enough to prevent its getting too much. Its marked slowness in taking effect gives the animals time to get a long distance from where the poison was obtained, thus increasing the danger from secondary poisoning and reducing the chances of finding the bodies of the dead animals.

Still another feature making thallium a certain destroyer is that no satisfactory antidote is known for it. When persons or domestic animals once absorb it, even in small amounts, they are certain to die or to be permanently injured.

As early as 1926, there were reports that plans were being made for the introduction of thallium into California as a squirrel poison. Although it had been used for killing rats in America and especially in Europe, there had been no field applications of it on a large scale in California. The early uses in this state were in field trials, one of them in Santa Clara County.

When this poison was finally given official approval by the agencies in charge of rodent control work, it was adopted quickly in practically every county where squirrels are serious pests. By the close of the 1930 season the counties indicated on the map (fig. 20) had been much more thoroughly worked for squirrel eradication than at any previous time. The aim during each of the preceding four years had been to cover every bit of the cultivated ground and grazing land in those

counties. With the perfection of the organization for scattering the grain, the amount of ground covered was being enlarged each year. This increased amount of activity, resulting in the covering of many millions of acres with poisoned grain, gave a much better opportunity to study the effects of the poisoned grain upon wild life than was afforded on any of the preliminary trials or even during thorough studies on small areas where conditions could not be expected to represent the whole area.

The present analysis is based upon observations of the effects of this poison in every part of the area and covering the whole period of this late campaign. The examples represent nearly every type of ground and of season. Although they do not represent every acre they do include practically every type of situation concerned in squirrel control there. These observations, then, provide a basis which is much more sound than any that has been available previously for the study of this problem. Practically all the persons whose reports have been used live on the ground where the observations were made. They have had, as a rule, a long and intimate acquaintance with the animals concerned and with the other conditions involved, such as climate, native and cultivated vegetation, the local problems of all sorts which affect agriculture, and with all the commonly used methods of rodent control.

Moreover it should be emphasized that these statements do not represent biased statements of personal opinion. Very few of these men have any trace of sentimental prejudice in favor of any kind of wild animal. In fact, many of them hold the opinion that squirrels should be poisoned even if every other wild animal is killed.

Some notion of the extent of the present activity in animal destruction may be gotten from a consideration of the amount of the poison distributed. In fifteen of the counties the amount of thallium-treated grain used in only one year, 1929, averaged 40,641 pounds, and in one county as much as 119,057 pounds was distributed. In addition, each of these counties carried on special activity in squirrel control by other methods such as have been in use for many years.

During 1928, 7,739,070 acres of land in the state were treated for ground squirrels (Ninth Rept. Calif. Dept. Agric., 1929). Out of the total of over 2,000,000 pounds of poisoned grain used, 602,728 pounds were thallium treated.

In the following review of observations, each paragraph represents the important facts learned from one person. In nearly every case, I have been given the evidence orally by the person who made the observation, or I have seen a statement signed by the observer. In addition to the number of animals found killed by squirrel poison and the name of the species, localities and dates are usually given. When the observer knew the kind of poison used it is indicated by a letter (T. for thallium, S. for strychnine). Other significant comments by these persons are added in a few instances. The name and address of the person who furnished any particular item of information can be furnished upon inquiry to the writer.

**Alameda County.**—About 100 individuals of Lewis woodpecker, California woodpecker, Nuttall woodpecker, red-shafted flicker, California jay, and Brewer blackbird; section northeast of Sunol; spring, 1927 and 1928; poisoned barley and oats. After an earlier campaign for squirrel control between Sunol and Pleasanton, golden eagles went to nearby ranches and made depredations on lambs. Even a dog was carried off by the birds. At one ranch as many as seven eagles were shot in this one season and the species was greatly reduced in that vicinity. Previously, when ground squirrels were available for food as many as four nests of eagles were known near this ranch and no damage to domestic animals was detected.

Many cottontail rabbits; October 1, 1930; near Newark.

Two deer; Mocho Cañon; latter part of September, 1930; (S.) barley. "Find about the same numbers of squirrels in about the same places in the mountains. Have

observed this for years. They do not seem to increase. Believe that coyotes and hawks keep the numbers down."

"After putting out any poison on my place near Mission San Jose, I always keep a close watch for several days to note results. While it takes much more strychnine to kill a bird than it does a squirrel, I find that if a blackbird consumes a good teaspoonful of poisoned grain, it will kill it. I have found a great many blackbirds, meadowlarks, and, when they happen to be present, wild pigeons. I have also found quail, but never where the poison was put out; but they seem always to go to where they roost and die there."

**Contra Costa County.**—A large number of doves, 4 quail, 15 chickens, 2 geese, 4 turkeys, and 9 cows; in vicinity of Mt. Diablo and Clayton; 1927 to 1930; (T.) hulled barley; squirrels as plentiful as ever in places.

About 48 quail; Mt. Diablo and foothills; 1926; barley.

Three to 5 meadowlarks, 10 to 15 blackbirds; near Pacheco; several years ago; (S.).

Thirty-two pheasants (nearly all in pairs); Bryon Tract; March, 1928; (T.).

Many pheasants, 14 goats, 1 wildcat; Point Orient; 1928; (T.). Fifty-six pheasants were turned loose on this area in 1925. They increased very satisfactorily for the first year or two. Thallium was scattered over the area in 1928 and 1929, resulting in the death of most of the birds. By the end of 1930 only 7 hens and 3 or 4 cocks were left on the Point.

Two valley quail, 5 ground squirrels, 4 Norway rats, 1 jack rabbit, 5 brush rabbits, 3 meadow mice, 4 wood rats, 1 cottontail rabbit; Moraga Valley; 3 hours on September 14, 1927, 4 days after poison had been placed; (T.).

**Fresno County.**—Poisoned grain is placed in practically all of the foothill districts and the larger portion of the cultivated area.

A number of doves, about 12 quail, several dozen rabbits; in foothills of Fresno Mountains and at Squaw Valley; summer, 1929 and 1930; barley; two chickens killed by thallium in very short time.

Six doves within one-fourth mile on railroad track, blackbirds; nine miles north of Reedley.

About 20 jack rabbits, 6 cottontail rabbits, 1 crow; 60-acre piece on Helm ranch on west side of San Joaquin River; latter part of February, 1929; (T.).

Five cottontail rabbits; near Academy; August 28, 1930; poisoned barley put out by owner.

Three skunks; Squaw Valley; 1927; (S.).

Two doves, 1 skunk, 1 gray fox; Sentinel School district; December, 1925.

Several doves, 5 quail; below Delpiedra on Kings River; August, 1930; (T.).

Up to the past year ranchers had poisoned squirrels with strychnine obtained from the county officers. Also the section foreman scatters poison to protect the railway embankment. This year so many dead birds were found that there was much discussion. Next, the ranchers, who had made game refuges out of their places, became alarmed. Meanwhile the birds, which during the dry season had gone to the river for water and had picked up the grain sown from a hand car, had disappeared. Also, all fur-bearers are gone from this locality. One man who kept traps out during nearly the whole 1930-31 season caught only 4 house cats and one opossum on an area where only a few years previously there were many skunks, coons, and coyotes.

Sixty or 70 tame pigeons; near Raisin City; 1930; (T.). All these around one place.

**Kern County.**—Control is attempted only on the areas most affected.

About 25 doves, many "bean birds", 10 rabbits; near Pattiway; January 1, 1931; (S.); barley and wheat scattered by owner of ranch.

Great many quail, doves, rabbits, and gray foxes; 1 M game refuge along Kern River; within last 5 years.

Two doves, 9 crows, 3 rabbits, 1 dog; Tehachapi Valley, Cummings and Brite valleys, near Tehachapi; August 1, 1930, to September 20, 1930.

Several doves, rabbits and skunks; near Woody; (S.).

**Kings County.**—Squirrels are considered generally not a serious problem on grazing lands in this county. Control work covers the entire county except a small portion in the southwest part.

Many doves, meadowlarks, blackbirds, turkey vultures, cottontail and jack rabbits; New Home School District west of Gurnsey; May, 1930; (T.).

**Los Angeles County.**—Work is done in all sections of the County where requested. Improvement on range lands after squirrel control has been estimated at from 20 to 50 per cent.

About 12 doves; near San Dimas; August, 1929. About 100 quail; near Triunfo; July, 1930.

Approximately 15 each of doves, quail, and rabbits; in hills surrounding San Fernando Valley; summer, 1929 and 1930. "Squirrel poisoning is very helpful to farmers. The poisoning of the birds is very unfortunate for sportsmen due to their scarcity already."

Doves, quail, and rabbits; Santa Ana River district; August, September, and October.

One-half dozen quail; 1927 to 1930.

**Madera County.**—Entire county covered except for high mountain area. Thallium has not been used in the foothill districts.

Many doves; in eastern part of county; summer; poisoned wheat for squirrels. "Do not think doves eat barley as readily as wheat. Badgers have been entirely eradicated by eating dead squirrels. I feel that squirrel poisoning is in a large measure responsible for the terrific lessening in the number of doves. Poison should be placed in winter when doves are not present."

As many as ten in one small field of doves, quail, meadowlarks, and gray foxes; at own place near Raymond; August and September, 1929 and 1930; poisoned wheat.

Ten or more of quail, jays, and squirrels; on own ranch; in summer; barley, "The average person putting this poison out clears his fields of stock, then broadcasts the grain at random over the land in different places and kills the squirrels—yes, and quail and other birds also. Where coveys of from 50 to 100 quail used to be seen here, there are now a few coveys of eight or ten birds."

Quail, coons, opossums, and dogs; on Chowchilla River.

Doves; Raymond.

Four badgers; August; poisoned by eating squirrels killed with wheat.

Many doves, gray squirrels, cottontail and brush rabbits; North Fork and Coarse Gold; June 15, 1929; May 20, 1930; July 30, 1930.

Lots of doves; in foothill country; late spring and early summer; hulled barley.

"Birds and rabbits have been found dead every year after poisoned barley was used on ranch near Mist. Have complied with poisoning request for the past ten years and each year have noticed, and others have also, that many kinds of birds, rabbits and skunks are found dead. A quail is not easily found because when it becomes sick it will hide and die. Birds that live in trees are most generally found because they drop on the ground. Quail have been protected on this ranch of 800 acres for the past ten years, but they are decreasing very rapidly. It must be the poisoned grain and not hunters in this case."

Particular flocks of quail disappeared or were greatly reduced after thallium was placed out, but, in these instances, no dead birds could be found. Thought that animals crawled into brush to die. The hunters in this district have been unable to find quail this year (1930).

**Merced County.**—Thallium has been used almost entirely in this county within recent years. In 1930 special efforts were made to cover the whole county consisting of about one and one-quarter million acres. Officials think that coyotes are being reduced in number to an easily appreciable degree due to squirrel poisoning operations.

Eighty dead geese of five kinds: Cackling, Hutchins, Canada, White-fronted, and Snow; around Lake Yosemite; December 1, 1930, to February 1, 1931. "Grain was found in the gullets of several of these birds. Yosemite Lake is resorted to as a loafing ground for geese that feed all over the general territory."

Sixty dead and dying geese along one mile of shore line at Lake Yosemite; December 10, 1930. This instance reported by P. A. Shaw in *Outdoor Life* (67, 1931, p. 42) who continued, "I have since been informed that ten to thirty additional geese died each day up to December 20, one report stating that sixty-five were counted on December 20. I believe that 250 to 300 would be a conservative



estimate of the total fatality. Qualitative tests for thallium by means of the spectro-scope were positive on thirty-two of the geese collected, and the diagnosis of thallium poisoning has now been fully verified by quantitative determination of thallium deposited in the edible tissues. Geese collected on December 18, and examined by another laboratory, indicate that phosphorus was responsible for many of the deaths. It is reported that phosphorus grain was distributed over a large acreage for the ten days preceding December 19. Since two poisons have contributed to the death of geese in the Merced area it is impossible to state which has caused the major damage. However, in so far as this laboratory has investigated, all deaths have been due to thallium."

Forty-six sheep; near El Nido; 1928 (T.). From an item in *Outdoor Life* (67, 1931, p. 42), which also states that "Wolfson further claimed the land was unfit for pasture for six months until rains had washed the poison away. He asked \$1,190 damages for the death of the sheep and subsequent unfitness of the land."

Six quail; foothills, eastern side of valley; (T.); hulled barley.

A great number of doves, quail, and skunks; near San Joaquin River and Panoche Plains; November and December, 1929.

Quail; near Delhi; (T.).

A few coyotes from eating poisoned squirrels; near Planada.

Meadowlarks, blackbirds, cottontail rabbits, brush rabbits, jack rabbits, skunks, and one coon; near Snelling.

Quite a few quail, doves, and meadowlarks; around Merced River country; in spring.

**Monterey County.**—Only parts of the county are covered each year. Six to ten men are kept in the field. Persons in charge of pest control here realize that "there never has been an animal pest, so numerous as squirrels, eradicated."

Forty quail on Zacher's Ranch, 6 quail and 8 doves on ranch back of King City; September, 1929; (T.).

Four quail, numerous sparrows, blackbirds and larks; foothills of Gabilan range east of Salinas; last two weeks of May, 1930; (T.). "I personally watched the poison being put out and it was not put in the runs or burrows but was scattered everywhere. We have used strychnine poison for years on our range lands for squirrels and have not found any dead birds of any description that we could trace back to the poison, but at the time the squirrel drive was on, dead birds of all description were easily found anywhere within two miles of the outside of the thallium poisoned area."

Three or 4 doves, 5 or 6 woodpeckers and linnets; Angell Ranch near Pleyto; April, 1930; (T. and S.). "To thoroughly poison the squirrels it would be extremely difficult and expensive to keep from killing a few birds and rabbits."

Two crows and 4 or 5 blackbirds; Doud Ranch near King City; between April 1 and 30, 1930; (T.). "My ranch has a little over 2000 acres and I used 1800 pounds of poisoned barley [T.] with good success. I did not see any dead animal with the exception of one dead rabbit. It looks to me as if the squirrels died inside their holes for I did not see a single dead squirrel on top of the ground."

One deer, a yearling doe (my friends have picked up dead quail); David Jack's property; 1929; (T.). "Reports have come to me from different land-lords that their ranches have been almost completely cleaned up as far as quail, doves, and rabbits go and there is no doubt that the scarcity of quail in Monterey County during the last few years has been caused by the use of thallium in the squirrel poisoning campaign. I have had good success in poisoning squirrels by the use of strychnine and barley and do not recall ever poisoning any quail, doves and rabbits. The use of wheat in any event is very bad."

Eight quail; Gabilan; March, 1930; (T.).

**Orange County.**—Thirty men working for about sixty days attempt to cover all the infested territory in this county.

Twenty to 30 doves, 12 quail, crows, 25 chickens, 15 or 20 rabbits; Telegraph Cañon; April, 1930; (T.). "Even sheep were killed, but county made good in this case."

About 25 doves; Orangethorp and Cypress Road; first part of July, 1930.

Eight quail, 2 sheep; Santa Ana Cañon; last of March and first of April. "Have had reports where almost whole bands of quail disappeared but saw no dead quail."

Several quail, doves, and rabbits; Olinda and Yerba Linda hills. "There are no quail in this locality and not a rabbit to be seen. They have all been killed off by the county putting out some kind of squirrel poison. I know of one man that lost 20 chickens from the grain."

Many doves and rabbits and a few quail; entire foothill section; 1928 and 1929; (T.). "Too much carelessness in placing poison in large amounts outside of squirrel holes, often dumped in shrubbery and cactus where no holes at all."

A news item sent out by the United Press from Anaheim, March 5, 1931, states that "one child was dead and four other persons suffered from paralysis after eating mush prepared from poisoned grain." According to this clipping, one of the victims "found a bag of wheat in a ranch house and took a quantity home to prepare a meal. Thallium, used as a squirrel poison, had been added to the wheat."

**San Benito County.**—Quite a number of quail and rabbits; near Pacheco Pass; past two years; (T.).

Doves and jackrabbits (not counted); (T. and S.). "There were some deer poisoned this year for the first time. They ate the thallium grain."

Rabbits, doves, larks, magpies and jays; on own ranch near Paicines; (S.).

**San Diego County.**—Entire county except mountains and waste land, covered each year.

Few cottontail rabbits. Estimated 50 doves; Coogan Ranch; June 17, 1927. Estimated 500 doves; Jamul Ranch; April 13, 1928. Estimated 2000 doves; Guejito Ranch; June 21, 1928. (S.). "These birds badly decomposed. No quail found although quail inhabit these same localities. At time these birds were poisoned, poison barley was broadcasted. Squirrel control campaigns should be either stopped or continued on a larger scale by poisoning cats, skunks, foxes, etc. As their natural food is taken away, it forces these animals to take game birds and animals beyond question."

Two hundred doves (estimated 500 killed); Jamul Ranch; April, 1928.

Four hundred doves; Jamul Ranch; 1928.

Comparatively few doves, linnets, rabbits, white-footed mice, and kangaroo rats; over most of county; 1929 and 1930; (T. and S.).

A large number of doves; two or three years ago.

Two valley quail, 1 Anthony towhee, 3 cottontails, and 1 brush rabbit; Lake Wohlford; May, 1930; (T.). "I did not see any poison except in holes or protected places."

Seventeen jays, 1 tree squirrel; Laguna Mountains; September and October, 1929; (S.). "They were around a camp ground which was badly infested with ground squirrels."

Several doves, 1 coyote; own ranch at Mesa Grande; 1929. "Doves up to normal now. Owing to heavy, late snow and rains very few young quail this year."

No estimate (not a large number) mice, kangaroo rats, rabbits, sparrows and linnets; during spring of 1929 and 1930; (T. and S.). "Proper care was used."

Quite a number of valley quail; Otay Mesa and near La Mesa; summer of 1929. "One of the two farmers talked to thought the campaigns valuable. The other was quite indignant over the killing of the birds."

Several dozen doves, rabbits, and gray squirrels; Wynota Valley; August, 1930; (S.).

**San Joaquin County.**—Forty-five quail, several skunks, hundreds of cottontails; Stewart Tract about 15 miles WSW. Stockton; March 6 and 12, 1928; (T.) hulled barley. "In the above case the poisoned grain was thrown all over the field, starting at one levee and continuing across the field to the other levee. A noted decrease in skunks caused by their eating other poisoned animals and birds. I have also found several other species of birds that were poisoned but was unable to ascertain just what poison was used."

Twenty-eight quail, 9 cottontails; Salmon Slough, Old River, and Stewart Tract; February or March, 1928; (T.). "On all the low land the ground is wet enough so it can be cleaned of squirrels with carbon bisulphide. Poison kills pheasants, quail and cottontail. I am not in favor of poisoning along levees."

Seventy-five valley quail, 60 meadowlarks, 40 doves, and 300 cottontail rabbits; Tracy; March 6 and 12, 1928; (T.).

Nine quail, 27 rabbits; lower division Roberts Island; November, 1928 and 1929.

An observer, on April 27, 1928, along 11 miles of a highway, beginning four

miles west of Stockton and thence west, saw approximately 14 live weasels cross the road ahead of his car and noted about as many dead ones on the highway in the same stretch of 11 miles. The live ones were seen singly (not in a bunch) and each weasel, with one exception, was going north. None was seen going south. The exception was one eating on a gopher snake that lay on the highway. On April 28, only the remains of one dead weasel could be found on the same stretch of road. Inquiry of four local residents in the neighborhood elicited the reply that each, in a recent trip over this road, had seen weasels crossing the road. These were the first individuals seen by any of these people for some time. A possible cause for this unusual movement of the weasels was suggested when it was learned that within one or two months previously, several thousand acres, beginning two miles south of this highway, had been covered with thallium-treated grain. One investigator learned that more than 500 valley quail, about 200 cottontail rabbits, more than 400 jackrabbits, many small passerine birds, numerous skunks as well as squirrels and other small animals had been killed. Evidently, as a result of the depleted food supply, the weasels left the area and traveled northward. Water surrounded the area on the west, east and south.

**San Luis Obispo County.**—Concerted campaign with thallium begun in 1928. One-half of county covered in 1929, three-fourths covered in 1930. As many as fifty crew foremen used at one time. Greater amount of thallium used than in any other county.

Several dozen doves and quail; Palo Prieto Ranch; 1928, 1929 and 1930; (T.) barley. "The poisoned grain was scattered broadcast over the ground. They kill about as many doves and quail as they do squirrels."

Few doves, linnets, ground birds, jays, and jack rabbits; past two years; (T.). "During that time, I have found several coyote carcasses undoubtedly killed by eating poisoned squirrels. In this locality coyotes were formerly very numerous. During the last eight months, I have not seen a live coyote and I am out on the range almost every day. Quail, formerly quite numerous, are becoming quite scarce, but I do not think many of them get poisoned."

Four golden eagles, 4 red-tailed hawks, 20 yellow-billed magpies; Paso Robles and Shandon; March 1 to 25, 1928; phosphorus. "I have seen a coyote last three days before it died."

"The poisoning of squirrels with thallium has killed off the coyotes, and I notice while riding the range that most every doe has two fawns this season which is very unusual."

Many rats, very few rabbits and doves; east of San Miguel; three years ago; (T.). "Many quail on my ranch and I have never found any signs of them having been killed."

Very few rabbits, crows, magpies and jays; northern part of county; 1928, 1929, 1930.

Hundreds of birds, rabbits, dogs, skunks, cats; around Shandon; spring, 1929.

Two quail, 3 doves; 1928; (T.).

**Santa Barbara County.**—Entire county covered by intensive work for three years. As many as twenty-five men employed at one time in placing grain.

Six quail, 11 doves; Buellton; December, 1929.

Coyotes and wildcats; Santa Barbara Forest; May, June, September and October; (T.) oats and (S.) barley. "Several tons of poison were put out on and adjacent to the forest during the current year, and only a few coyotes and wildcats were found killed."

Several tree squirrels; Santa Ynez Valley and Montecito; 1929; (T.). "Having charge of several properties in Santa Barbara County, one of which consists of a six thousand acre ranch, I am convinced that the present method of broadcasting squirrel poison causes a reduction in the number of birds and other wild life where such methods are used."

Five wildcats; near Los Alamos; in past two years; (T.). "On 15,000 acres of land formerly one of worst squirrel-infested in the county, I have watched very closely all of these campaigns, and I have as yet to see any birds that have been killed, but I have seen coyotes and wildcats that I am sure were killed by eating squirrels that had been poisoned."



**Santa Clara County.**—Entire county covered during last four years. Greater dependence placed on strychnine than upon thallium.

Fifteen chickens; near Los Gatos, Shannon road; fall of 1927; (T.).

Jays, blackbirds, coons, skunks, rabbits; southeastern part of county; over period of four years; (T. and S.).

About 15 or 20 quail in one place; 1925.

Three coons, 5 skunks; east of Gilroy; winter of 1929.

Three or 4 rabbits; Pacheco Pass; August, 1928; (T.). "In orchard. Rabbits and squirrels lived together and were considered equal pests."

Raccoons, skunks, opossums. "They have done their work as far as squirrels are concerned, also killing all the rabbits and many varieties of birds. The quail have about all disappeared from their haunts."

"One man put out 50 pounds of poisoned grain. I was there about two weeks later and counted 27 dead rabbits and 7 quail and found the squirrels still in good health. This year the man who does the squirrel poisoning in this section came on my mother's ranch in the dove nesting season. In going through an oak grove, just on the low limbs I could see from the ground in a three-hour search, I found 29 dove nests with either dead young or rotten eggs. Also three pheasants, one badly mangled, but two stiff with no wounds on them. Two years ago on the same ranch some poison was put out about 200 yards from the house with no squirrels within a quarter of a mile, and it got 18 chickens."

The following report is from a man in Morgan Hill: "Enclosed golden-crowned sparrow is one of three found dead near my house here yesterday and today. I do not recall finding a single one heretofore, that is, dead, in fourteen years. Two of these I found myself this morning right under a heavy vine where they are in the habit of roosting. The squirrel man from the Department of Horticulture was here two or three days ago and put out hulled barley treated with thallium. He assured me that birds would not take this barley, though he admitted my suggestion that doves might be an exception." A little hulled barley was found in the stomach of the bird saved. October 18, 1926. The same man wrote on November 26, 1926, as follows: "Have found several other dead birds, a couple right with the poison, including quail—and a screech owl near the remains of the quail—white-crowned sparrows, juncos, towhees."

**Santa Cruz County.**—Entire county covered. Special attention to this work for four years.

One hundred and fifty quail (reported to one man); summer of 1929; (T.).

**Stanislaus County.**—Intense campaign with thallium began in 1930. Aim is to cover entire county. Nearly fifty men employed to spread thallium-treated grain during first season of its use.

Eight quail; along south shore of Don Pedro Lake; August, 1930.

**Tulare County.**—Cover all cultivated and grazing lands comprising about one million acres. Fifteen men employed.

Four doves; hill country east of Lindsay; August, 1930; (T. and S.).

Sixty doves, 15 quail; September 1 to 23, 1930. "In one place there was a man driving the truck and the other on the back of the truck throwing the grain out along the road as they drove along."

Five hundred to 750 doves, 50 quail, 4 coons, 40 to 50 skunks; vicinity of Lemon Cove and Three Rivers; 1924 to present.

Five doves, 4 civet cats; about November 20, 1930.

Three doves, 5 wild pigeons, 1 brush rabbit; Cottonwood School District; July, 1930; barley.

Four quail (with barley in stomachs), jays and wild pigeons; near Springville; July and August, 1930. "The poisoned squirrels have been a death blow to the coyotes in a little valley in the edge of the foothills north of Porterville. I have seen some dead ones off from the road in that section."

Several quail and doves; foothills; November 15 to 30, 1929. "No quail now, where plentiful before."

Several each of quail, doves, wild pigeons, gray squirrels; lower Kaweah River watershed; one afternoon in November, 1925. "Poisoning squirrels robs the fur bearer of easiest meat supply causing him to kill poultry and livestock."

Many pigeons, quail, doves, skunks, opossums, and coon; along lower portion

of Kaweah River. This family, and "all the people around like to eat the squirrels, even in preference to other kinds of game. They do not take away matter from the soil, as is the case when land is grazed and the meat sold, or when a crop is harvested. Either they furnish natural food for carnivores or themselves die and help to build soil. When they are removed, then the predators must go without food or go to the ranches where they become pests."

Three quail, 2 doves, 5 rabbits; Woodlake; September 15 to 25, 1930; (T.).

Ventura County.—One or two doves, pigeons; Cuyama Valley; barley.

Two doves, 4 quail; 1928; (T.).

Eight doves, 3 gray squirrels; Santa Susana; (T. and S.).

"A house cat got a squirrel and took three weeks to die. A mule was turned out in the pasture Saturday morning where a lot of the poison had been put out a week or two before and it died Sunday. We believe it saw the oats (he would not have seen them if there had not been a little pile) and ate them. Casitas Pass, in July. Two or three years ago on our ranch, before any poison had been put out, there were lots of foxes and bob cats, but today there are no bob cats and few foxes."

Few brown birds, 2 doves; Santa Paula Cañon and out on Foothill Road; summer, 1929; (T.).

One-half dozen or more towhees and white-crowned sparrows, 12 or more cottontail rabbits and kangaroo rats; Santa Susana; March, 1929.

Records not assigned to counties.—More than 60 valley quail, 9 mourning doves, 4 crows, 3 Nuttall sparrows, 9 red-winged blackbirds, 4 meadowlarks, 8 spurred towhees, 3 lark sparrows, 4 ravens, 9 Brewer blackbirds, 4 striped skunks, 2 weasels, 1 coon, more than 60 cottontail rabbits; San Joaquin, Kern, Contra Costa, San Mateo, and San Benito counties; 1928, 1929, and 1930; (T., S., and Phosphorus). These animals were found by one person who had special opportunities to observe squirrel control operations.

A summary of the relatively meager observations recorded in this report shows that the lowest possible number of kinds of animals killed by squirrel poison, other than squirrels is sixty. A list of these follows with the total number of individuals actually found and reported for each. (When inclusive estimates were given, the lowest figure was taken.)

|                             |      |                             |   |
|-----------------------------|------|-----------------------------|---|
| Mourning dove.....          | 3314 | Woodrat .....               | 4 |
| Valley quail.....           | 713  | Nuttall sparrow.....        | 3 |
| Cottontail rabbit.....      | 490  | Lark sparrow.....           | 3 |
| Tame chickens.....          | 95   | Meadow mouse.....           | 3 |
| Pheasants.....              | 82   | Deer .....                  | 3 |
| Wild geese (5 species)..... | 80   | Golden-crowned sparrow..... | 3 |
| Meadowlark.....             | 67   | Gray squirrel.....          | 3 |
| Tame pigeon.....            | 60   | Weasel .....                | 2 |
| Striped skunk.....          | 53   | Tame geese.....             | 2 |
| Sheep .....                 | 48   | Dog .....                   | 1 |
| Brewer blackbird.....       | 23   | House cat.....              | 1 |
| Jack-rabbit.....            | 21   | Gray fox.....               | 1 |
| Yellow-billed magpie.....   | 20   | Coyote .....                | 1 |
| Crow .....                  | 16   | Anthony towhee.....         | 1 |
| Goat .....                  | 14   | Screech owl.....            | 1 |
| Cows .....                  | 9    | Mule .....                  | 1 |
| Red-winged blackbird.....   | 9    | Lewis woodpecker.....       |   |
| Coon .....                  | 8    | California woodpecker.....  |   |
| Spurred towhee.....         | 8    | Nuttall woodpecker.....     |   |
| Brush rabbit.....           | 7    | Red-shafted flicker.....    |   |
| Wild cat.....               | 6    | California jay.....         |   |
| Turkey .....                | 4    | Wild pigeon.....            |   |
| Civet cat.....              | 4    | Turkey vulture.....         |   |
| Badger .....                | 4    | Opossum .....               |   |
| Red-tailed hawk.....        | 4    | Linnet .....                |   |
| Golden eagle.....           | 4    | White-footed mouse.....     |   |
| Raven .....                 | 4    | Kangaroo rat.....           |   |
| Norway rat.....             | 4    | Junco .....                 |   |

The long series of facts just presented indicate the great variety of animals which lose their lives directly or indirectly from the use of thallium in California. However, they are wholly insufficient for judging the total number of individuals which die in this manner. Although these counts reach into thousands, even for single species, they represent observations on only a small fraction of the whole area treated with poison. The whole number of animals killed must be many times greater than is indicated by the figures given here.

Some additional factors which must be considered in a final solution of the problem of squirrel control are suggested in the following paragraphs.

Among the birds most frequently poisoned, mourning doves take the grain readily, with certain death following. There is loss not only of the adult birds but often also of broods of young or sets of partly incubated eggs. If the poison is scattered in early summer it takes all the birds that have successfully passed many dangers, the breeding stock, and hence it results in a greater loss to the species than if an equal number of birds were poisoned at some other season. If the poison is scattered at a season when these birds are gone, it is likely to result in a lesser squirrel reduction. There is small possibility of exterminating the mourning dove from the United States, but squirrel control continued as in the past four years is almost sure to lead to removal of this bird as a common summer resident in the area marked on the map (p. 93). Further, it seems probable that any process of restocking of doves from outside areas would be a slow one.

Pheasants appear to suffer greater losses than any other kind of bird on the poisoned areas. Chances for survival of these introduced birds are meager at best, but when thallium-treated grain is scattered on their feeding ground there is no chance for them to survive. Persons interested in the propagation of this bird should select, for stocking, some area outside the range covered with thallium.

Valley quail are affected by thallium poisoning campaigns, but as yet it is impossible to foresee whether this factor will be sufficient actually to cause the disappearance of the species from the area. It has been definitely established that quail will eat thallium-treated barley, and that they are killed by it. Also, the facts that whole coveys have disappeared from poisoned ground and that the species became so reduced in whole counties as to be not worth hunting have been observed. However, it is certain that during the past two seasons quail have suffered severe losses from other causes, such as cold fogs and rains during the nesting seasons and the long drouths which have reduced the normal amount of food. Another factor which must be considered is that in those places where rodents have been poisoned and flesh-eating animals have not been killed off by eating poisoned carcasses the carnivores constitute an additional hindrance to the maintenance of quail numbers.

Squirrel control with thallium has an important influence upon fur-bearing animals, of the kinds which provide nearly all the income to trappers in California. Those animals most affected are skunk, wild cat, coyote, gray fox, coon, and opossum. All of these will eat the bodies of dead animals that have been killed with thallium. The facts reported above show that where ground has been poisoned almost every animal upon which this group depends for food is killed. If these secondary feeders are not quickly killed, their pelts are almost certain to be ruined for fur because, as has been pointed out, the loss of hair is one of the known effects of thallium upon animals.

Another possibility of which there are examples is that when the food for carnivores (both birds and mammals) is quickly removed these latter animals leave the usual feeding ground in search of sustenance. On such occasions the only places

where food can be obtained are the farmyards. The hungry animals, the ones which do not starve, congregate there and thus make necessary another pest control campaign.

All representatives of this group of flesh eaters are slow breeders when compared with the grain feeders which are poisoned first. It is to be expected, then, that once they are removed from the large area which has been affected in California, a long period of years will be necessary to restore them to desirable numbers,—that is, provided the intensive poisoning is not continued. In the latter case there can be no return of carnivores. During this slow period of recuperation, hunting and trapping for fur cannot be profitable in these districts and demands for extra activity in pest control are to be expected, for rodents and vegetable feeders can repopulate an area at a faster rate than can carnivores; besides, the rodents would not be hindered in their increase by carnivores.

Still another point in this connection is that, with continued special activity in this type of pest control, progressively fewer examples may be available to demonstrate the effects of the poison on other animals than the pests. It may be that only the pests will be able to persist.

As to the effects of extensive poison campaigns upon the California digger ground squirrels, it is now recognized by practically all workers that they cannot hope ever to remove this animal from California or to prevent its reinvading small areas whence it has been removed. It has been learned (Jacobsen, 1923, p. 58) that in the case of this ground squirrel (*Citellus beecheyi beecheyi*) on an area where there had been consistent control for two years or longer "the litters were uniformly larger than on areas where the work had either just been started this year or had been in force for eight or nine months". If this discovery holds in the case of other rodents, there is a possibility that some one or more of these species, which hitherto have been present in numbers that were kept down by the effects of normal factors in their environment, might develop into serious pests.

It has been demonstrated many times in the past four years, in California, that the use of thallium poisoned grain, along with and in addition to the other methods of squirrel killing, will kill great numbers of squirrels. The immediate effect of this poison on the squirrel pest is of the same sort as upon other kinds of animals. However, it has not been proved that this great reduction of squirrels temporarily has justified the high cost of the poison and of the labor required in placing it. Much of the protestation against its use has come from farmers in the foothill sections where squirrels provide only one of the serious problems confronting them.

Workers on areas where poisoned grain has been scattered often remark that they have never seen any dead animals. This does not mean necessarily that no animals were killed, for in the case of a slow-acting poison there is a strong probability that most of the poisoned animals will reach hiding places before they die. Also it is not to be expected that these workers will be sufficiently careful observers to discover carcasses other than the most exposed ones.

During the early years of the use of thallium in California, the United States Bureau of Biological Survey attempted to exercise the closest possible control on the introduction and use of this poison. A letter written by the Chief of the Bureau on December 9, 1926, states that "it has been directly through our persistent efforts that the general use of thallium has been prevented and we shall continue to exercise the same efforts to have this done in the future".

However, in an article on rodent control investigations in California, a representative of the Biological Survey in 1928 published directions for the use of thallium,

along with a warning as to the possible dangers in its use. That this federal agency still approves the use of thallium is shown by the latest recommendations, available in February, 1931. These mimeographed instructions contain no hint of any important change in recommended method of procedure from the one that has been followed during the whole period of use of thallium. In other words, there is every indication that the sort of practices reviewed in this report will continue in California, unless checked through public protest. My studies indicate that throughout the period of the intensive use of thallium the county authorities have made a determined effort to follow explicitly the instructions supplied them. There is a remarkable uniformity in the methods employed in the counties where there was greatest activity.

After a careful study of the material mentioned in this discussion, and a consideration of the natural history of each animal concerned and of other related phases of agriculture in California, it is possible to offer some comments as to future ground squirrel control. Possibilities for the future may be thought of as leading in one of three general directions.

1. The attempt to control squirrels might be stopped altogether. This course has been advocated by some people, but it really does not merit serious consideration.

2. Authorities may develop more and more extensive and more thorough campaigns for artificial "control" of wild life. This leads rather directly to a constant war on all animals except the domesticated ones, and necessitates a certain allowance for loss to these and even to man. Trends in agricultural administration in late years seem to indicate that a large proportion of the leaders in that industry advocate such drastic action as this, but that they have given little thought to the ultimate outcome of such practices.

3. A policy for squirrel reduction may be developed on a different basis of attack from any so far used. The aim, instead of being for as much killing as possible would be for as little as possible. That is, an attempt would be made to reduce the losses to crops rather than solely to kill squirrels. Such a policy would take advantage of as many natural checks upon squirrels as possible, but also, especially on cultivated lands, it would take greater precautions in artificial reduction in order to save as many animals as possible.

Some of the difficulties involved in such a program would be avoided if the squirrel control supervisors and field foremen were required to pass a test in basic knowledge of natural history. In most cases the experience of these men in the field gives all the knowledge of squirrels which they need. What is lacking is an appreciation of the kinds of interrelations which exist between the organisms in the areas concerned. These are not necessarily the same in detail in all localities.

#### BIBLIOGRAPHY

Dixon, J.

1925. Control of the California ground squirrel. Univ. Calif. Coll. Agric., Exp. Sta., Circ. 296, pp. 1-15.

Dixon, W. E.

1927. Thallium. Proc. Roy. Soc. Med., 20, pp. 1197-1200.

Editorial.

1929. Thallium poisoning. Jour. Am. Med. Assoc., 92, pp. 1865-1866.

Ehrhardt, K.

1927. Der Einfluss mütterlicher Thalliumvergiftung auf die Nachkommenschaft. Klin. Wochschr., 6, pp. 1374-1375.

## Garlough, F. E.

1918. Rodent eradication work of the Biological Survey in California. Monthly Bull., State Comm. Hort., 7, pp. 781-789.  
1928. Rodent control investigations in California. Monthly Bull., Dept. Agric., State of Calif., 17, pp. 406-412.

## Grinnell, J., and Dixon, J.

1918. Natural history of the ground squirrels of California. Monthly Bull., State Comm. Hort., 7, pp. 597-708.

## Jacobsen, W. C.

1918. A history of ground squirrel control in California. Monthly Bull., State Comm. Hort., 7, pp. 721-761.  
1923. Rate of reproduction in *Citellus beecheyi*. Jour. Mammalogy, 4, p. 58.

## Lamy, M.

1863. Sur les effets toxiques du thallium. Comp. Rend. Acad. Sci., 57, pp. 442-445.

## Lynch, G. R., Lond, M. B., and Scovell, J. M. S.

1930. The toxicology of thallium. The Lancet, 219, pp. 1340-1344.

## Miscellany.

1927. Treatment of ringworm with thallium acetate. Jour. Am. Med. Assoc., 89, p. 2217.

## Munch, J. C.

1928. The toxicity of thallium sulphate. Jour. Am. Pharm. Assoc., 17, pp. 1086-1093.

## Swain, R. E., and Bateman, W. G.

1909. The toxicity of thallium salts. Jour. Biol. Chem., 7, pp. 137-151.  
*Museum of Vertebrate Zoology, Berkeley, California, April 1, 1931.*



TWO PRIMITIVE RAILS FROM THE EOCENE OF  
COLORADO AND WYOMING

WITH NINE ILLUSTRATIONS

By ALEXANDER WETMORE

In the fossil collections of the National Museum there is the lower end of a tibio-tarsus of a bird, collected several years ago by Mr. W. H. Bradley during work for the United States Geological Survey, that the writer recently has studied critically with the result that the bone proves to come from an extinct rail. A further fossil specimen of this family has been presented by Dr. E. L. Troxell of Trinity College, Hartford, Connecticut, from recent collections in Wyoming. Descriptions of these two follow.

## Family RALLIDAE

*Eocrex primus* gen. et spec. nov.

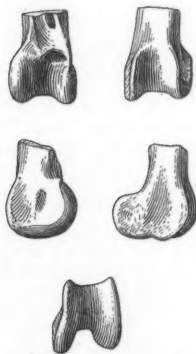
*Characters*.—A ralline form of large size, the lower end of the tibio-tarsus being slightly larger than that of the modern *Porphyrio melanotus* Temminck (Man. Ornith., ed. 2, vol. 2, October 21, 1820, p. 701). General outline somewhat similar to that of modern *Aramides ypecaha* (Vieillot) [*Rallus ypecaha* Vieillot, Nouv. Dict. Hist. Nat., vol. 28, 1819, p. 568], but lower end somewhat more compressed, inner condylar sulcus narrower, and without the projecting tooth external to the lower opening of the supratendinal bridge at the inner anterior base of the external condyle common to Rallinae, as well as to Aramidae and Gruidae (figs. 21-25).

*Description*.—Type, distal end of right tibio-tarsus, U. S. Nat. Mus. Cat. No. 12043, from near the top of the Cathedral Bluffs tongue of the Wasatch formation of the Eocene, near Steamboat Springs, Sweetwater County, Colorado, in Sec. 13, T. 24 N., R. 102 W., collected August 1923, by W. H. Bradley. Lower end of shaft

rounded elliptically on sides and behind, in front strongly excavated by a longitudinal groove, this groove being deepest on inner side where it has a sharply angular bottom in cross-section; supratendinal bridge broad and strong, with perforation beneath it nearly round and relatively small; internal condyle viewed laterally quite round, with only a slightly greater anterior than posterior projection, lateral face somewhat excavated, free margins slightly thickened; external condyle elongated anteriorly so that in lateral outline it is somewhat shoe-shaped, free margin slightly raised, a little thickened anteriorly, with a projecting tubercle on outer face in a line with anterior margin of the shaft; intercondylar sulcus broadly open; intercondylar fossa deep cut with abrupt walls, being somewhat deeper toward external condyle; external tubercle for the attachment of the oblique ligament low and little pronounced; only a slight projection below at the outer lip of the lower tendinal opening beneath the supratendinal bridge.

*Measurements*.—Transverse breadth of lower end of shaft 7.6 mm.; greatest transverse breadth across condyles 10.6 mm.; external transverse diameter of external condyle 11.4 mm.; external transverse diameter of internal condyle 12.0 mm.

FIGS. 21-25. TYPE SPECIMEN OF *Eocrex primus*, NATURAL SIZE.



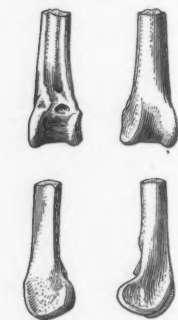
*Remarks*.—The species here described in many respects appears intermediate between the subfamilies Rallinae and Gallinulinae, though seemingly more nearly like the Gallinulinae, so that it is placed in that subfamily. In general outline it is more like the living *Tribonyx mortierii* of Tasmania than any other species seen, but the resemblance here in minute detail is not particularly close. *Eocrex* is believed to have been a swimming bird rather than one that waded.

The relationship of *Eocrex* to the three described species of *Telmatornis*, which come from the Eocene beds of New Jersey, is at present vague. *Telmatornis affinis* and *T. priscus*, known from fragmentary humeri, seem to have been smaller. *Telmatornis rex*, also known from a humerus, was apparently about the size of *Eocrex* but of highly peculiar form. From available information it does not now seem that the two genera are closely related.

*Palaeorallus troxelli* gen. et sp. nov.

**Characters.**—A ralline form of medium size with the lower end of the tibio-tarsus somewhat larger than that of the modern *Rallus longirostris* Boddaert (Tabl. Planch. Enl., 1783, p. 52 [Cayenne]); general form somewhat similar to that species, but lower end of bone relatively broader and heavier; external condyle stronger and heavier; space on anterior face of shaft external to tendinal bridge broader; groove for peroneus profundus lying more on external side of shaft; intercondylar sulcus relatively broader (figs. 26-29).

**Description.**—Type, distal end of right tibio-tarsus, U. S. Nat. Mus. Cat. No. 12042, collected from the Wasatch formation of the Eocene in a badlands locality a short distance south of Preator's Ranch, northwest of Little Tatman Mountain, and south of Burlington, Wyoming, in 1929, by Edward L. Troxell (orig. no. T 312). Lower end of shaft flattened anteriorly, with a slightly raised line external to center, forming two very faintly indicated longitudinal depressions; margins also slightly raised; a high, raised internal margin above supratendinal bridge; sides and posterior margin of shaft rounded, becoming flattened laterally and posteriorly as shaft descends toward the condyles; supratendinal bridge broad, tilted only slightly from longitudinal axis of shaft, with the passage beneath relatively large; space external to this bridge relatively broad, with indication of a projecting toothlike process external to lower external margin of bridge (that has, however, been broken away and lost); external condyle, viewed laterally, elliptical in outline, its circle being flattened from above downward, projecting forward beyond axis of shaft, its external margin raised (partly broken away anteriorly); internal condyle flattened and considerably elongated anteriorly, the external margin raised, with center of condyle considerably excavated externally; external faces of both condyles with poorly developed projecting tubercles, that on the external condyle being near the center, and that on the internal condyle being in a line with the anterior margin of the shaft; intercondylar sulcus broadly open, the intercondylar fossa being deeply cut with abrupt, perpendicular wall on inner side, and lower, more rounded wall on outer side; a distinct excavation below lower end of supratendinal bridge; groove on side of shaft for tendon of peroneus profundus long and well impressed, running along angular junction of external and anterior faces of shaft.



FIGS. 26-29. TYPE SPECIMEN OF *Palaeorallus troxelli*, NATURAL SIZE.

**Measurements.**—Transverse breadth of lower end of shaft 5.1 mm.; transverse breadth across condyles 8.2 mm.; external transverse breadth of external condyle (approximate due to breakage) 7.9 mm.; external transverse breadth of internal condyle (approximate due to breakage) 8.2 mm.

**Remarks.**—This form is apparently allied to living members of the subfamily Rallinae and is placed in that group. In the diagnosis it is compared with *Rallus longirostris* as a matter of convenience but is not considered a close relative of that genus. The peculiarities setting it apart from *Rallus* seem also to distinguish it from related rails. It is believed to have been a walking form rather than one that regularly swam in deep water.



As in the case of *Eocrex* the relation of *Palaeorallus* to the three forms of *Telmatornis* described from the Eocene of New Jersey is uncertain. *Telmatornis rex* was larger. *Telmatornis affinis* and *T. priscus*, named from broken humeri, from comparison with bones of *Rallus longirostris* and *Palaeorallus* seem also to have been slightly larger. It does not appear that the genera *Palaeorallus* and *Telmatornis* were closely related.

Associated with the type specimen of *Palaeorallus* there were two indeterminate bits of bone, one bearing the same collector's number (T 312) as the type, and the other without mark.

Professor Troxell writes that the species here described is certainly from the Wasatch formation because of the presence in the same beds of *Eohippus* and other contemporary fossils. He has generously presented the type specimen to the U. S. National Museum. The species is named in honor of the collector, Dr. Edward Leffingwell Troxell.

*Smithsonian Institution, Washington, D. C., February 18, 1931.*

## THE BIRDS OF THE ROGUE RIVER VALLEY, OREGON

By IRA N. GABRIELSON

There is perhaps no state in this country more variable from a biological standpoint than Oregon. Consequently it is impossible to point to any one area or fauna as typically Oregonian, despite a widespread popular belief that the state is so wet that all the inhabitants thereof have webbed feet. As a matter of fact, at least half the area of the state is desert or semi-desert country, and it is possible to find all degrees of wetness or aridity within its boundaries.

The Rogue River Valley is one of the distinctly different areas to be found in this state, and it is by no means the least interesting. The area included in this paper is, for all practical purposes, Jackson and Josephine counties, which are almost entirely included in the drainage basin of the Rogue and its tributaries. It includes roughly the west slope of the Cascades, the south slope of the Umpquas, the north slope of the Siskiyou, and the foothills and valleys between, particularly the valley of the Rogue, itself, to a point near Galice where the river enters its narrow cañon.

The western slope of the Cascades is well clothed with timber, which gradually gives way first to oak groves and then, lower down, to manzanita and chaparral. The timber as a rule is much more scattered and of smaller growth over the Siskiyou and that part of the Umpqua range lying within the area under consideration. Enormous local variation in flora and fauna renders it almost impossible to make any attempt at accurately mapping life zones or faunal areas.

The Siskiyou, with large areas of serpentine, granite, and other rocks, have developed a flora of their own, that some botanists tell the writer is one of the most unique conditions found in the west, a fact not at all reflected in the bird population. In fact, the chief impression received is not a difference, but rather a paucity of bird life of the same species as compared with similar areas in the Cascades.

With these few facts on the general conditions in mind, it is possible to give general ideas of the zonal conditions found here. The floor of the valley itself and the foothills for a varying elevation above are most distinctly Upper Sonoran. Not only are characteristic Upper Sonoran species found, but in many cases they are the dominant forms. Among birds that come in this category may be mentioned California Jay, California Woodpecker, Brown Towhee, Plain Titmouse, Ash-throated Flycatcher, Bullock Oriole, and Western Lark Sparrow.

Among mammals, *Citellus douglasi*, *Microtus californicus*, *Peromyscus truei gilberti*, and *Neotoma fuscipes fuscipes* are common and characteristic forms of the chaparral belt. In addition, a kangaroo rat, *Perodipus heermanni gabrielsoni*, has been found to be a fairly common inhabitant of the brushy hillsides on the east and north sides of the valley.

Several species each of *Ceanothus* and *Arctostaphylos* are the dominant woody plants of the chaparral belt. Above this, and probably covering more of the area than any other zone, is a broad belt of yellow pine timber representing the Transition. Pileated Woodpeckers, Western Tanagers, Calaveras Warblers, Western Robins, and Oregon Chickadees are among the common birds found in this zone.

The Canadian zone is represented by a more or less continuous belt of Douglas fir, Engelmann spruce and lodgepole pine, which covers the summits of the various ridges in the Cascades and Siskiyou. *Callospermophilus chrysodeirus*, *Thomomys monticola mazama*, *Ochotona princeps brunnescens*, *Eutamias senex*, *Peromyscus maniculatus gambeli*, *Microtus mordax*, *Erethizon epixanthum*, and *Sorex bendirii* are among the common small mammals of this zone, while the Arctic and Alaskan

three-toed woodpeckers, Red-naped Sapsucker, Townsend Solitaire, Sierra Hermit Thrush, Olive-sided Flycatcher, Thurber Junco, Fox Sparrow, and Hermit Warbler are characteristic breeding birds.

Neither the Hudsonian or Arctic-Alpine zones are definitely represented, except for traces on the northern slope of Mt. McLoughlin, where the area is too small to have developed any characteristic zonal belts. Practically all other points visited in the district are Canadian to the summits, although there may be a district in the Wagner Butte and Ashland Peak sections where Hudsonian can be found. I have not visited this area, but there is a district of considerable extent to the north of these peaks which offers such possibilities.

This paper is based entirely on my own notes and specimens and on those of Stanley G. Jewett of Portland who has kindly given me access both to his notes and his collection, in order that the list may be as complete as possible.

***Podilymbus podiceps*.** Pied-billed Grebe. A group of three half-grown young and one adult was seen on July 21 and also on July 22, 1926, on a small pond in Little Butte Creek near Brownsboro, Jackson County. Residents in the vicinity stated that a pair of these birds had remained all summer at this point. At least two birds of this species remained on this same pond into November, being noted by the writer on September 26 and 29, and November 4 and 19, 1926.

***Mergus americanus*.** American Merganser. Noted more or less commonly on the Rogue throughout the year. On July 12, 1926, a female and brood of downy young were observed in Graves Creek, Josephine County, by Jewett and myself.

***Lophodytes cucullatus*.** Hooded Merganser. S. G. Jewett reports seeing this species at the Tolo Dam in Jackson County on March 19, 1923.

***Anas platyrhynchos*.** Mallard. S. G. Jewett has two records—January 29, 1919, and March 1, 1924, both near Medford. This is one of the species which undoubtedly occurs more commonly than the records given here indicate.

***Botaurus lentiginosus*.** Bittern. While crossing a great lava flow on the head waters of Butte Creek on September 20, 1927, I flushed one of this species from a clump of small trees growing in a small pocket in the lava. Doubtless it was a resting migrant, but at that it had chosen a most unusual place in which to rest.

***Ardea herodias* (fannini?).** Great Blue Heron. So far as either my notes or those of S. G. Jewett are concerned this bird is a casual winter visitor from November to April. We have usually noted lone individuals along the Rogue and tributary streams. No skins are available and therefore the subspecies inhabiting this area is a matter of doubt. I would expect it to be *A. h. fannini*, as the birds are largely winter visitors.

***Butorides virescens anthonyi*.** Anthony Green Heron. Jewett has recorded (Condor, xxx, 1918, p. 129) two birds of this species noted by Vernon Bailey and himself along the Rogue River at Grants Pass. It is rare anywhere in Oregon.

***Fulica americana*.** Coot. Two individuals of this species were seen at the Grebe pond on Little Butte Creek on September 26, 1926.

***Lobipes lobatus*.** Northern Phalarope. S. G. Jewett collected one in spring plumage, out of a flock of three feeding along the Rogue River near Savage Rapids Dam, on May 17, 1922. This record was mentioned in Bird-Lore (xxiv, 1922, p. 226).

***Capella gallinago delicata*.** Wilson Snipe. A single bird seen in a little swamp near Williams, Josephine County, on April 16, 1921, two near Kerby, April 3, 1927, and one at Eagle Point on September 26, 1926, constitute my own records for the district. J. H. Heckner, in a letter, reported seeing one in the swamp at Mosquito Ranger Station, Crater National Forest, on January 11, 1927.

***Ereunetes mauri*.** Western Sandpiper. Jewett reports a flock on the Rogue near Gold Hill, May 17, 1922. Suitable feeding ground for such species is not available except on a very limited scale, hence sandpiper records are lacking.

***Totanus melanoleucus*.** Greater Yellow-legs. One collected on the meadow near Big Elk Ranger Station, Crater National Forest, on September 20, 1927.

***Actitis macularia*.** Spotted Sandpiper. A pair of downy young was found at Twin Ponds on July 24, 1926. These ponds are two small pools found on the summit

of the Cascade Mountains north of Mt. McLoughlin in extreme eastern Jackson County. Birds of this species have also been noted commonly about the shores of Fish Lake on the south side of this mountain and at other points throughout the Rogue River Valley.

*Oxyechus vociferus*. Killdeer. A common resident which has been noted on practically every visit to the district. It is also common about the lakes and ponds in the higher Cascades, on the headwaters of the Rogue River.

*Collinus virginianus*. Bob-white. An old male sat on a fence post near Brownsboro, Jackson County, on June 29, 1919, and whistled several times as I watched him. Jewett noted one August 23, 1923, at Tolo in Jackson County. These are our only definite records for this introduced species.

*Oreortyx picta picta*. Plumed Quail. This is a rather common bird in the Cascades down to about 3000 feet, below which line it is gradually replaced by the California Quail. It has been seen in various localities along the summit from Snowshoe to the Ashland-Klamath Highway. The year 1926 seems to have been very favorable to these birds, as large coveys of them were numerous in the mountains during the last half of July. One nest containing eight eggs was discovered on Butte Creek, June 10, 1921.

*Lophortyx californica*. California Quail. This is the most abundant game bird in the Rogue River Valley. It has been seen in numbers on every visit.

*Dendragapus obscurus sierrae*. Sierra Grouse. The Sierra Grouse is found throughout the higher parts of the Siskiyou and Cascade mountains, but in my experience it cannot be called a common species. I have two records for Josephine County, one near Grants Pass on May 11, 1920, and one at Winona on April 12, 1921. Jewett also has two, one on Evans Creek, October 7, 1926, and the other at Gold Hill, March 26, 1916.

This species has not been considered as common in Jackson County, but was more common in 1926 than in other years. A male collected on the north side of Mt. McLoughlin on July 24, 1926, was my first record for Jackson County. A male dusting in the middle of the Fish Lake road, was seen on July 31. Three birds were seen on September 25, and four on the 26th, near Mosquito Ranger Station, and others were heard at various times in the same locality in September and November.

*Bonasa umbellus sabini*. Oregon Ruffed Grouse. This is a fairly common species, particularly in the Cascades. I have seen it on Butte Creek, at Fish Lake, Mosquito Ranger Station, Rustler Peak and Brownsboro, all in Jackson County. Specimens collected are somewhat lighter colored than Willamette Valley birds.

*Phasianus torquatus*. China Pheasant. This introduced game bird is fairly plentiful throughout the valley, but it is not as abundant as in the Willamette Valley or parts of eastern Oregon.

*Columba fasciata*. Band-tailed Pigeon. Common but somewhat erratic migrant both in March and October.

*Zenaidura macroura marginella*. Western Mourning Dove. One of the characteristic birds of the Rogue River Valley, and during the late summer and early fall one of the most conspicuous birds of the district.

*Cathartes aura septentrionalis*. Turkey Vulture. A common summer resident of the district. Successful squirrel poisoning operations on the oak ridges can always be located by the numbers of these birds soaring about the vicinity.

*Accipiter velox*. Sharp-shinned Hawk. A fairly common permanent resident which can be seen in all parts of the district.

*Accipiter cooperii*. Cooper Hawk. I have records at various seasons in different parts of the district, of this permanent resident species.

*Astur atricapillus striatulus*. Western Goshawk. Only twice in the last several years have I observed this species in the Rogue River territory. The first occasion was at Mosquito Ranger Station on September 24, when an immature Goshawk swooped at an Olive-sided Flycatcher that I happened to be watching. The second individual was noted high up on the slopes of Rustler Peak in a dense forest of Engelmann spruce on November 7, 1926.

*Archibuteo lagopus sancti-johannis*. Rough-legged Hawk. A specimen which had been shot and hung on a fence near Medford, noted by S. G. Jewett on February 22, 1930, constitutes the only available record of this species in the county.

*Buteo borealis calurus*. Western Red-tailed Hawk. This is the most common hawk of the district except the Sparrow Hawk. It has been noted on almost every visit and is found at all altitudes.

*Aquila chrysaëtos*. Golden Eagle. Jewett has a record of one seen flying over Gold Hill on May 17, 1916.

*Falco mexicanus*. Prairie Falcon. An adult male Prairie Falcon in fine plumage was collected by the writer near Eagle Point on November 8, 1926, and Jewett saw a single bird on March 1, 1924, near Medford.

*Falco columbarius columbarius*. Pigeon Hawk. Jewett saw a Pigeon Hawk at close range near Medford on February 27, 1927. All specimens except coast birds, collected in this state so far, are referable to this form. I have no reason to believe that any other except *F. c. suckleyi* occurs. Its status in the territory is doubtless that of a rare migrant.

*Falco sparverius sparverius*. American Sparrow Hawk. This is by far the most abundant hawk of this area. It is commonly seen along the highways and roads at all seasons of the year. Careful comparison of western Oregon birds with eastern specimens convinces me that our Oregon form is not distinguishable from *sparverius*.

*Pandion haliaëtus carolinensis*. American Osprey. Jewett saw two of this species at Tolo, Jackson County, on April 23, 1922.

*Asio flammeus*. Short-eared Owl. Jewett saw a single bird near Medford on December 19, 1918, which is the only record for the county that I have found. It is probably a more or less erratic winter resident.

*Scotiaptex nebulosa nebulosa*. Great Gray Owl. On December 14, 1918, Jewett saw a specimen of this owl in a Medford store which according to the owner had been killed about seven years previously. Later Mr. Bartlett, taxidermist, informed Jewett that he had mounted three from near Prospect in the winter of 1917. In view of the above information there is no doubt that this species is a rare winter migrant to this area.

*Otus asio bendirei*. California Screech Owl. I have only one record, that being a bird seen on May 14, 1920, in Medford. However, they are frequently heard calling at night, especially in the oak and chaparral belt. There is a skin in the Jewett collection taken March 21, 1925, near Eagle Point.

*Bubo virginianus saturatus*. Dusky Horned Owl. One bird seen on Butte Creek June 12, 1921, and one noted near Big Elk Ranger Station, Crater National Forest, have been the only ones actually seen, but I have rarely camped at night in the district without hearing one or more hooting. I have not seen skins from this area, but Jewett has handled two which were both typical *B. v. saturatus*.

*Speotyto cunicularia hypugaea*. Burrowing Owl. A permanent resident of the lower parts of the valley, being most abundant in the rocky area between Medford and Eagle Point. I have seldom crossed this district without seeing one or more of these birds.

*Glaucidium gnoma californicum*. California Pygmy Owl. There is a skin of this species in the Jewett collection taken at Gold Hill, March 24, 1916. He also noted one in the same locality on April 5, 1916.

*Megaceryle alcyon caurina*. Western Belted Kingfisher. A permanent resident along the Rogue River and about the mountain lakes and streams.

*Dryobates villosus orius*. Modoc Hairy Woodpecker. This species is one of several found in this district that are intermediates in form. In this case the majority of the birds are between *orius* and *harrisi* but closer to the former. This is particularly true of breeding birds, some of which are good *orius*. Occasional winter specimens closely approach *harrisi*, and I have two that can be matched exactly by winter skins from Portland. It is possible that further collecting would reveal the fact that a definite proportion of the winter birds are *harrisi*.

*Dryobates pubescens turati*. Willow Downy Woodpecker. Summer birds of this species seem properly to be intermediates between *D. p. turati* and *D. p. gairdneri*. I have one specimen taken at Medford, May 2, 1919, which has been identified as *turati* by H. C. Oberholser. The majority of individuals taken by me are intermediates, with some winter birds undoubtedly much closer to *gairdneri*. This is another of the cases of intergradation which makes this district so interesting ornithologically.

*Xenopicus albolarvatus albolarvatus*. Northern White-headed Woodpecker. White-headed Woodpeckers are not common in this district, although they are occasionally noted in the upper edge of the yellow pine belt on the western slope of the Cascades. One female shot near Mosquito Ranger Station on September 29, 1926, and a second one seen on Rustler Peak on November 6, 1926, were both near the 5000-foot line and well toward the upper limit of the yellow pine.

*Picoides arcticus*. Arctic Three-toed Woodpecker. This woodpecker is a regular, but not common, resident of the highest part of the Cascades found in Jackson County. A dam built across the outlet of Fish Lake raised the water enough to kill the timber about the shore and has resulted in the presence of numbers of these birds. Scattered birds are to be met with throughout the lodgepole pines. Several specimens have been collected.

*Picoides americanus fasciatus*. Alaska Three-toed Woodpecker. On July 24, 1926, a young male was taken out of a lodgepole thicket near Four Mile Lake on the Jackson-Klamath County line. This species is a rather rare resident of the higher parts of the Oregon Cascades. It is not typical *P. a. fasciatus* but is nearer this form than any other.

*Sphyrapicus varius nuchalis*. Red-naped Sapsucker. A quite common species along the eastern slope of the Cascades, that can only be considered a straggler into the territory covered by this paper. A single adult was seen at close range on July 27, 1926, at Mosquito Ranger Station on the west base of Mt. McLoughlin.

*Sphyrapicus ruber ruber*. Northern Red-breasted Sapsucker. A single female collected by Stanley G. Jewett at Grants Pass, December 9, 1918, is clearly this subspecies. It is identical with Portland winter birds. All other winter birds from southern Oregon in both Jewett's collection and my own are *S. v. daggetti*. Further collections would undoubtedly reveal *ruber* as being a more or less regular winter visitor.

*Sphyrapicus ruber daggetti*. Sierra Red-breasted Sapsucker. A fairly common breeding bird in the Cascades and a migrant through the valley. I have seen and taken fledglings at various points from Snowshoe to Fish Lake. These breeding birds are somewhat intermediate between *daggetti* and *ruber*, but much closer to the former.

*Sphyrapicus thyroideus*. Williamson Sapsucker. This is another quite common bird of the east slope of the Cascades, which is less common in the area covered by this paper. Two birds seen near the head of Four Bit Creek on July 23, one fledgling taken almost on the county line between Jackson and Klamath counties on July 24, several seen in the vicinity of Mosquito Ranger Station from September 23 to 27, and one taken on Rustler Peak on November 6, constitute my entire list of records, all of which were in 1926.

*Ceophloeus pileatus picinus*. Western Pileated Woodpecker. This large crow-sized woodpecker is a fairly common permanent resident. It is well distributed throughout the yellow pine areas of both counties. I have Josephine County records from Winona, Williams, and Grants Pass, and Jackson County ones from Butte Creek, Brownsboro, and Four Bit Creek. The work of this species is seen much more frequently than is the bird. Judging from this work it spends a part of its time in the firs, although I have never seen it there but once.

*Balanosphyra formicivora bairdi*. California Woodpecker. One of the characteristic birds of the lower parts of the valley, that frequents the oak hills and orchard districts. In the latter areas it is cause of occasional complaints from the fruit growers because of its habit of pecking ripening fruit in the fall months.

*Asyndesmus lewisi*. Lewis Woodpecker. A common permanent resident of the foothill districts, that shares with the California Woodpecker the odium of doing damage to fruit. It occasionally occurs far up in the mountains, but in this district seems to be primarily a foothills species.

*Colaptes cafer collaris*. Red-shafted Flicker. The flickers of this district, like so many other forms, are intermediates, difficult to place. Some are quite typical of *collaris*, and an occasional winter bird closely approaches Portland specimens of *saturation*, but the great majority of specimens are intermediates, nearer the former.

*Phalaenoptilus nuttallii californicus*. Dusky Poor-will. At various times I have heard poor-wills calling near the J. H. Heckner place above Brownsboro. On May



21, 1927, I heard two, and on September 17 of the same year I saw one in the light of my car, in addition to hearing one or two call. Several times during June and September of 1928, I again heard them calling in this same area. On June 21, 1929, I was fortunately able to collect an adult male bird which is clearly *californicus*. This is the first definite record of this form for Oregon, as well as a considerable northward extension of range. The poor-wills are sparingly distributed over the manzanita and chaparral thickets of the western foothills of the Cascades.

*Chordeiles minor hesperis*. Pacific Nighthawk. A common summer resident of the district. It is one of the characteristic birds of the valley floor and is especially abundant on the rocky flats between Medford and Eagle Point.

*Chaetura vauxii*. Vaux Swift. A rather uncommon summer resident. For two seasons I knew of three birds which presumably nested in an old chimney near Brownsboro; at least I watched them flying in and out of it in June of 1920 and 1921. It is a scattered summer resident of the Cascades; groups of three to a dozen were noticed on various occasions about the base of Mt. McLoughlin. Two which are now in my collection were taken near Lake-of-the-Woods, July 21, 1927.

*Selasphorus rufus*. Rufous Hummingbird. A common summer resident which arrives early in March (March 6, 1924) and is found at least well into September. It is found at all elevations up to timber line.

*Stellula calliope*. Calliope Hummingbird. A male taken by S. G. Jewett at Gold Hill, May 19, 1916, furnishes the only record of this species for the district.

*Tyrannus verticalis*. Arkansas Kingbird. A common summer resident in the lower parts of the valley, which has been recorded on every visit from May to September. It occasionally straggles to the higher parts of the Cascades, one having been noted at Mosquito Ranger Station on July 26, 1926.

*Myiarchus cinerascens cinerascens*. Ash-throated Flycatcher. This is another of the characteristic summer resident birds of the lower country. It is particularly partial to oak groves and thickets, and is found up to about 4000 feet, which is also approximately the upper limit of the oak.

*Sayornis sayus*. Say Phoebe. A regular, but not abundant, resident, from late February to October so far as my records show.

*Nuttallornis borealis majorinus*. Olive-sided Flycatcher. A characteristic species of the lodgepole pine thickets along the summit of the Cascades. It is also found, although not so commonly, in the fir lower down, and one bird was seen on June 12, 1926, along the river near Grants Pass.

*Myiochanes richardsonii richardsonii*. Western Wood Pewee. A common summer resident throughout the district, being found at all elevations except the highest ridges. A pair feeding young was observed near Mosquito Ranger Station, July 27, 1926.

*Empidonax difficilis difficilis*. Western Flycatcher. Small flycatchers of this genus are common in this district, but usually are wild and difficult of approach. No identifications based on field observation have been attempted, the records being limited to actual specimens taken. One bird of this species was collected at Brownsboro, June 19, 1924.

*Empidonax traillii brewsteri*. Traill Flycatcher. One specimen of Traill Flycatcher was taken on Little Butte Creek on June 11, 1921. This is undoubtedly the most common small flycatcher in the district.

*Empidonax hammondi*. Hammond Flycatcher. A specimen collected on Little Butte Creek on June 11, 1921.

*Otocoris alpestris strigata*. Streaked Horned Lark. A very common permanent resident of the cultivated districts of the valley. These birds are not typical *strigata*, but are closer to this form than to any other.

*Otocoris alpestris merrilli*. Dusky Horned Lark. A male collected by S. G. Jewett on February 21, 1930, near Medford is identical with winter birds from eastern Oregon and is undoubtedly of this subspecies. This is not surprising, as *O. a. merrilli* is an abundant wintering bird in Klamath County to the eastward. Extensive winter collecting would undoubtedly result in the taking of others of this form.

*Cyanocitta stelleri frontalis*. Blue-fronted Jay. Jays of this species are intermediate between *frontalis* and *carbonacea*, but somewhat closer to the former in the Rogue River Valley. Specimens sent to J. Grinnell have all been returned

labelled "*frontalis* (not typical)." This confirms my opinion as to the status of the species. In view of the intermediate character of so many species in this area, this is what one would expect.

*Aphelocoma californica immanis*. California Jay. Another characteristic species of the chaparral and oak areas of the valley. It is a common permanent resident which is quite in evidence even to the casual observer. S. G. Jewett reports finding a nest containing five young at Gold Hill on May 17, 1916.

*Perisoreus obscurus griseus*. Gray Jay. A permanent resident of the higher parts of the district. It is particularly common around the base of Mt. McLoughlin in eastern Jackson County and in similar situations throughout the Cascades. It is the most conspicuous winter bird resident in the Engelmann spruce, and has been seen in numbers on every visit, regardless of the season. S. G. Jewett reported several near the Oregon Caves on September 13, 1922, and I saw numbers of them on the head of the Applegate River in July, 1928.

*Corvus brachyrhynchos hesperis*. Western Crow. A common permanent resident of the valley proper, but is seldom seen higher than the oak belt of the foothills.

*Agelaius phoeniceus caurinus*. Northwestern Red-winged Blackbird. A good series of this species is available from this district. It is a fairly common summer resident wherever there is sufficient swamp area for nesting sites. Careful collecting of specimens in all parts of the area has failed to reveal either *A. p. californicus* or *A. tricolor*. Both of these species are supposed to be found in Oregon and if so should be found here. So far, however, neither Mr. Jewett nor I have been able to secure them here or elsewhere in the state.

*Sturnella neglecta*. Western Meadowlark. A common permanent resident of the district. This species was particularly numerous during January, 1929; flocks of considerable size were common during the period January 21 to 25, while I was in the valley.

*Icterus bullockii*. Bullock Oriole. A conspicuous and quite common summer resident of the district, which has been recorded on every visit from April 13 to September.

*Euphagus cyanocephalus minusculus*. Brewer Blackbird. A common permanent resident which wanders over the district in fall and winter, in flocks of considerable size. There is some complaint by farmers that wintering flocks of this species and Northwestern Red-wings do considerable damage to fall seeded grain by pulling it up as it comes through the ground. Such complaints are sporadic and local, and the damage is confined to isolated spots so far as my observations go.

*Hesperiphona vespertina californica*. Evening Grosbeak. A permanent resident of the higher parts of the district, which varies greatly in abundance from year to year. In 1926 an exceedingly conspicuous part of the bird life of the Mt. McLoughlin district, but except for that year I have considered it as rather scarce. S. G. Jewett reports seeing two in Grants Pass on March 20, 1925. Two specimens collected at Mosquito Ranger Station near Mt. McLoughlin on July 29, 1926, are similar in every way to specimens from the Warner Mountains, labeled *H. v. californica* by Dr. Oberholser.

*Carpodacus purpureus californicus*. California Purple Finch. A common permanent resident of the timbered areas of the district. It is the Purple Finch of the yellow pines, but on the summits mingles with *C. cassinii*. At Mosquito Ranger Station I have several times seen mixed flocks of the two species working on the salt logs in much the same fashion as Crossbills.

*Carpodacus cassinii*. Cassin Purple Finch. A fairly common permanent resident of the higher parts of the Cascades adjacent to Mt. McLoughlin and Rustler Peak.

*Carpodacus mexicanus frontalis*. House Finch. A very common permanent resident about the towns and farm homes of the entire valley, often competing with the English Sparrow for nesting sites and becoming almost as much of a nuisance about the homes.

*Loxia curvirostra pusilla*. Crossbill. Crossbills have frequently been seen flying overhead, and once (April 30, 1919) they were noted in the City Park in Medford. All other records were made in the higher part of the Cascades.

*Spinus tristis salicamans*. Willow Goldfinch. A common permanent resident of the valley, and at least a summer resident of the mountains up to 5000 feet.



*Spinus psaltria hesperophilus*. Green-backed Goldfinch. Another common permanent resident of the lower districts.

*Spinus pinus pinus*. Pine Siskin. Another common permanent resident of the district; found more commonly in the higher parts in summer, but everywhere during the fall and winter.

*Poocetes gramineus affinis*. Oregon Vesper Sparrow. A summer resident of the district.

*Passerculus sandwichensis sandwichensis*. Aleutian Savannah Sparrow. Two taken at Eagle Point, Jackson County, on November 5, 1926, were identified by J. Grinnell as *sandwichensis*. *P. s. brooksi* undoubtedly occurs as a migrant, as it breeds abundantly in the Willamette Valley to the north.

*Passerculus sandwichensis alaudinus*. Western Savannah Sparrow. A rather scarce bird which has been seen in the district from April 15 to November 9, and which undoubtedly winters occasionally. One specimen, a migrant collected at Mosquito Ranger Station, has been identified by Grinnell as *alaudinus*.

*Chondestes grammacus strigatus*. Western Lark Sparrow. A common summer resident of the cultivated areas of the valley. It may remain through the winter, as several have been observed as late as November 9.

*Zonotrichia querula*. Harris Sparrow. A rare straggler to Oregon; recorded by W. L. Dawson from the Rogue River Valley on the basis of two specimens collected by G. L. Hamlin at Medford, Oregon (Condor, xvi, 1914, p. 14). These skins are at present in the Jewett collection, no. 3774, male, collected February 1, 1912, at Medford, and no. 3959, a female, collected February 2, 1912, at the same place.

*Zonotrichia leucophrys nuttalli*. Nuttall Sparrow. A very common spring and fall migrant, particularly during March and April, September and October. It may breed at higher levels in this district, but so far it has not been noted in any of my trips into the territory.

*Zonotrichia coronata*. Golden-crowned Sparrow. A very common spring and fall migrant. Fairly common winter resident of the brush patches in the valley of the Rogue.

*Spizella passerina arizonae*. Western Chipping Sparrow. A very common summer resident species throughout the district.

*Junco oreganus thurberi*. Thurber Junco. A common permanent resident of the district. A nest with four eggs was discovered on Little Butte Creek on June 10, 1921. Dr. Grinnell has checked over my Rogue River specimens and found them all referable to this form. *J. o. shufeldti* probably occurs in small numbers in winter, but so far I have failed to secure specimens of that race.

*Melospiza melodia*, subspecies? Song Sparrow. The Song Sparrows of this valley are very puzzling. Dr. Oberholser has called some of the breeding birds *merrilli* and Dr. Grinnell has identified some as *morphna*. Specimens of typical *morphna* have been secured in the valley during the winter months, but the breeding birds are far different. Superficially they resemble *merrilli* far more than *morphna*, but the range is separated from that of *merrilli* by a great area occupied by *fisherella*. In fact the birds appear intermediate between *fisherella* and *morphna*, but cannot be referred to any subspecies satisfactorily.

*Melospiza lincolni gracilis*. Forbush Sparrow. A migrant through this area. There is one in the Jewett collection taken at Medford on April 23, 1922, and one from Tolo, taken April 22, 1922.

*Passerella iliaca altivagans*. Alberta Fox Sparrow. A bird collected at Mosquito Ranger Station, September 29, 1926, has been identified by Grinnell as this form. Migrating and wintering Fox Sparrows are abundant at times in the Rogue Valley and a number of forms in addition to this one have been taken.

*Passerella iliaca insularis*. Kodiak Fox Sparrow. One taken at Pinehurst, March 22, 1925 (S. G. J.).

*Passerella iliaca sinuosa*. Valdez Fox Sparrow. The most abundant migrant and wintering form. There are three skins in the Jewett collection taken near Pinehurst, on the summit of the Cascades, March 22, 1925, and one from Grants Pass, collected on December 11, 1918. I have two taken at Mosquito Ranger Station on September 24, 1926, two from Grants Pass, November 9, 1926, and one from Brownsboro on November 8, 1926.

*Passerella iliaca townsendi*. Townsend Fox Sparrow. One taken November 15, 1917 (S. G. J.), at Grants Pass.

*Passerella iliaca mariposae*. Yosemite Fox Sparrow. A breeding male collected at Robinson Butte on June 13, 1921, was identified by Dr. Oberholser as *mariposae* and made the basis of a state record published in the Condor (XXV, 1923, p. 139). Breeding birds from nearby areas have been variously labeled *fulva* and intermediate between *fulva* and *mariposae* by J. Grinnell and Harry Swarth. This area, up to this time the only one on the western slope of the Cascades where Fox Sparrows have been found breeding in Oregon, is evidently occupied by an intermediate group of birds which is not readily referable to any form. Robinson Butte is only a few miles from Californian breeding stations of *mariposae* and is very similar to the country on the eastern slope of the Cascades inhabited by *fulva*, most of which are regarded as not entirely typical of *fulva*, but tending towards *mariposae*.

*Passerella iliaca fulva*. Warner Mountains Fox Sparrow. A bird collected at Pinehurst on June 18, 1923, has been identified by Dr. Grinnell as this form.

*Pipilo maculatus oregonus*. Oregon Towhee. A single bird taken at Winona, Josephine County, on April 12, 1921, is undoubtedly a wintering bird from the Willamette Valley. It is identical with birds from the Portland area.

*Pipilo maculatus falcinellus*. Sacramento Spotted Towhee. All of my summer birds and some winter specimens have been identified as of this form by Dr. Grinnell.

*Pipilo fuscus bullatus*. California Towhee. This is another California species which is a common bird in the valley of the Rogue and Umpqua, but not found elsewhere in Oregon.

*Oberholseria chlorura*. Green-tailed Towhee. Two birds were seen and one, a young bird, collected at Mosquito Ranger Station on July 27 and 28, 1926. Another single individual was noted near the same place on September 23, 1926.

*Hedymeles melanocephalus melanocephalus*. Black-headed Grosbeak. Common summer resident which is found regularly up to at least 5000 feet.

*Passerina amoena*. Lazuli Bunting. Another common species of the valley floor, which is found less abundantly up to 4000 feet.

*Piranga ludoviciana*. Western Tanager. Another common nesting bird in the yellow pine belt and lodgepole area.

*Petrochelidon albifrons albifrons*. Cliff Swallow. A fairly common summer resident.

*Hirundo rustica erythrogastrer*. Barn Swallow. Another of the common summer residents.

*Iridoprocne bicolor*. Tree Swallow. A fairly common migrant whose earliest appearance was on February 22, 1930, when numbers were seen over the fields near Central Point.

*Tachycineta thalassina lepida*. Northern Violet-green Swallow. This is the most common nesting swallow of the district. In July the birds commence to congregate in flocks along the irrigation ditches. From this time until they depart for the south, they feed over the meadows in increasing numbers. S. G. Jewett reports seeing one at Grants Pass on February 25, 1927, which is the earliest spring record either of us has, of this bird in Oregon.

*Stelgidopteryx serripennis*. Rough-winged Swallow. One record from Brownsboro, Oregon, on June 29, 1919.

*Bombicilla cedrorum*. Cedar Waxwing. A few at Brownsboro, June 15, 1921.

*Lanius borealis*. Northern Shrike. S. G. Jewett saw a Northern Shrike at Grants Pass on November 30, 1916.

*Vireo gilvus swainsonii*. Western Warbling Vireo. A very common summer resident of the oak and chaparral.

*Vireo solitarius cassinii*. Cassin Vireo. A very common summer resident of the higher parts of the Cascades and equally common migrant in the lower areas where it probably also breeds.

*Vireo huttoni huttoni*. Hutton Vireo. This is not a common bird anywhere in Oregon although widely distributed in the western part of the State. There is a specimen from Grants Pass (November 15, 1917) in the Jewett collection. Jewett also reports one sight record at Grants Pass, December 11, 1918, and several about Gold Hill, March 22 to April 6, 1916.

*Vermivora ruficapilla gutturalis*. Calaveras Warbler. A very common summer resident of oak and chaparral areas in the two counties. Jewett collected a nest and five eggs near Gold Hill, May 16, 1916.

*Vermivora celata lutescens*. Lutescent Warbler. A common spring migrant and possibly breeding species, although no nests have been discovered. Birds have been seen as late as June 13.

*Dendroica aestiva brewsteri*. California Yellow Warbler. A very common summer resident up to 4000 feet.

*Dendroica coronata hooveri*. Alaska Myrtle Warbler. Jewett collected a specimen near Pinehurst, March 22, 1925; the species undoubtedly occurs regularly in March and April and again in September and October, as it does farther north.

*Dendroica auduboni auduboni*. Audubon Warbler. An abundant migrant throughout the district, being most conspicuous during April and September. It is also a summer resident of the higher parts of the Cascades and a more or less common winter resident.

*Dendroica nigrescens*. Black-throated Gray Warbler. Another common summer resident of the oak ridges up to at least 4000 feet.

*Dendroica occidentalis*. Hermit Warbler. The Hermit Warbler cannot be considered a common bird anywhere in Oregon, but it probably comes nearer reaching that status in the Cascades of eastern Jackson County than elsewhere. The birds are summer residents in some numbers along Little Butte Creek, Union Creek, and along the north base of Mt. McLoughlin. Doubtless there are similar colonies in other suitable spots. A female with four newly fledged young was watched, for some time, on July 24, 1926, along the shore of a small pond at the north base of Mt. McLoughlin.

*Oporornis tolmiei*. Macgillivray Warbler. This species is one of the most conspicuous summer residents in the ceanothus thickets which are most luxuriant between 4000 and 5000 feet on old burns. It has been noted lower down, in the breeding season, but is not as abundant as at this altitude.

*Geothlypis trichas occidentalis*. Western Yellow-throat. A regular summer resident in suitable swampy areas along the Rogue and its tributaries.

*Icteria virens longicauda*. Long-tailed Chat. A quite common summer resident of the valley floor. Jewett discovered a nest containing three eggs, on May 22, 1916, near Gold Hill.

*Wilsonia pusilla chryseola*. Golden Pileolated Warbler. There is a specimen in the Jewett collection taken May 18, 1916, near Gold Hill. The species is doubtless a regular migrant through the territory, although no other specimens have been taken.

*Anthus spinoletta rubescens*. Pipit. A very common migrant and quite common winter resident.

*Cinclus mexicanus unicolor*. Dipper. A quite common permanent resident along mountain streams, both in the Cascades and Siskiyou. Jewett saw a pair feeding young near Trail on April 22, 1922. This nest was built on a bridge stringer. I have, on a number of occasions, watched parents feeding newly fledged young along the creeks on the western slope of the Cascades.

*Salpinctes obsoletus obsoletus*. Rock Wren. Jewett saw one near Ashland, February 20, 1926—the only record so far for the territory. There is no reason why it should not be found more or less regularly on rock slides about Ashland, as conditions are suitable there.

*Catherpes mexicanus punctulatus*. Dotted Cañon Wren. On December 9, 1926, I collected a single bird on Salt Creek about ten or twelve miles east of Brownsboro. This bird was feeding about over a large rock slide at the base of a lava flow. Its characteristic chip first drew attention to it; and when finally, after considerable maneuvering, it was secured, it proved to be this species. Jewett saw two near Ashland on February 20, 1926, and W. E. Sherwood collected a specimen near Ashland on February 21, 1924 (Condor, xxvi, 1924, p. 112).

*Thryomanes bewickii calophonus*. Seattle Wren. While the resident birds of this species belong to *T. b. drymoecus*, occasional winter birds are undoubtedly visitors from the Willamette Valley. I have two birds collected by W. E. Sherwood at Ashland, November 20 and November 22, 1923, which have been identified by Grinnell as "*calophonus*, not typical". Other birds in the Jewett collection as well as my own are without doubt Willamette Valley birds.

*Thryomanes bewickii drymoecus*. San Joaquin Bewick Wren. A common permanent resident throughout the area up to 4000 feet. My summer specimens and those in Jewett's collection clearly belong to this race.

*Troglodytes aedon parkmanii*. Western House Wren. A fairly common summer resident.

*Nannus troglodytes pacificus*. Western Winter Wren. A common winter resident and at least an occasional summer resident on the higher ridges.

*Telmatodytes palustris paludicola*. Tule Wren. Marsh Wrens are not common in this territory because of absence of suitable marsh conditions. Jewett has one from Medford, March 1, 1924, and at various times I have heard and seen them in a little swamp near Eagle Point.

*Certhia familiaris zelotes*. Sierra Creeper. A fairly common permanent resident.

*Sitta carolinensis aculeata*. Slender-billed Nuthatch. A regular and well distributed permanent resident.

*Sitta canadensis*. Red-breasted Nuthatch. Another fairly common permanent resident which is most conspicuous in the lodgepole pine areas.

*Sitta pygmaea pygmaea*. Pygmy Nuthatch. Jewett reports several about Pinehurst, March 22, 1925. The species should be regularly found in the yellow pine areas in this vicinity, as it is a quite common species a few miles farther east in exactly similar territory.

*Baeolophus inornatus inornatus*. Plain Titmouse. This is a common permanent resident of the valley and one of the characteristic birds of the chaparral area.

*Penthestes atricapillus occidentalis*. Oregon Chickadee. Fairly common permanent resident in the Rogue River Valley and up to about 3000 feet.

*Penthestes gambeli abbreviatus*. Short-tailed Mountain Chickadee. It is odd that in the many trips made into the mountains of these two counties no birds of this species were noted. The only record I have for this district is a sight record by Jewett from near Holland, Josephine County, November 22, 1914.

*Penthestes rufescens rufescens*. Chestnut-backed Chickadee. A common permanent resident from 4000 feet to the timber-line on Mt. McLoughlin.

*Psaltriparus minimus californicus*. California Bush-tit. A common permanent resident of the oak districts. In July, 1926, I found it common at Mosquito Ranger Station and even above, up to 4500 feet.

*Chamaea fasciata fasciata*. Wren-tit. There are apparently several colonies of this bird in the Rogue River Valley. Jewett found them at Gold Hill, Medford, and Grants Pass in 1916, 1917, and 1918, and for the past three years (1926-8) I have known a small colony near Grants Pass.

*Regulus regulus olivaceus*. Western Golden-crowned Kinglet. A common permanent resident.

*Corthylio calendula grinnelli*. Sitka Kinglet. A common winter resident from October to March or April.

*Myadestes townsendi*. Townsend Solitaire. A regular summer resident in the Cascades down on the west slope to about 3000 feet. It occasionally straggles lower, but it is much more abundant at about 5000 feet. In winter it is of more or less regular occurrence on the floor of the Rogue River Valley.

*Hylocichla guttata guttata*. Alaska Hermit Thrush. Two males of this species are in the Jewett collection. Both were taken at Grants Pass, Oregon, on December 10, 1918. I have a male taken at Mosquito Ranger Station, September 26, 1926.

*Hylocichla guttata nanus*. Dwarf Hermit Thrush. S. G. Jewett has one skin of this form from Grants Pass, taken on November 15, 1917, and I have a male taken at Brownsboro, November 8, 1926.

*Hylocichla guttata sequoiensis*. Sierra Hermit Thrush. A fairly common summer resident of the fir and spruce in the higher Cascades of Jackson County.

*Turdus migratorius propinquus*. Western Robin. A very common permanent resident; sometimes exceedingly abundant during the winter.

*Ixoreus naevius naevius*. Varied Thrush. Noted at Winona and Merlin, Josephine County, April 12 and 14, 1921, Mosquito Ranger Station in Jackson County, on September 23, and four or five at Willow Prairie Ranger Station in the same county, on September 24 and 25, 1926. J. H. Heckner says that occasionally, follow-

ing severe snowstorms in the mountains, the birds invade the valley in considerable numbers. They were common about Brownsboro on February 21, 1930.

*Sialia mexicana occidentalis*. Western Bluebird. Common permanent resident.

*Sialia currucoides*. Mountain Bluebird. A pair of adults of this species was watched feeding a family of newly fledged young near Twin Ponds, near the Cascade summit, on July 24, 1926.

*Portland, Oregon, April 12, 1930.*

## FROM FIELD AND STUDY

**Late Nesting of a Pair of Barn Swallows in Montana.**—Last fall (1930) I had the opportunity of observing a pair of Barn Swallows (*Hirundo erythrogaster*) raise a second brood of young surprisingly late in the season. The date on which the young birds left the nest, September 15, is much later than any other corresponding date, for any species of native bird, that I have found in recording more than thirteen hundred nests in Montana during several years past. Of interest also is the fact that the average date of fall departure for the Barn Swallow here, as determined from my records, is eleven days before this brood of young birds left the nest, and twenty-one days before these birds began their migration.

The nest, used in raising both broods of young, was built upon a short plank nailed to the lower side of two rafters of a machine shed on our ranch near Fortine, Montana. Construction of the nest was finished on June 11; the set of five eggs was completed by June 17. Two of the young birds left the nest for the first time on July 21, and the remaining three left on July 23.

For about two weeks following the latter date, the adult birds and all of their family frequented the shed when not feeding. On August 1, one of the adult birds was seen carrying feathers to the nest. Thinking that a second brood of young was to be raised, I examined the nest every day for nearly a week. As no eggs were found, and no further indication of a second nesting was seen, I paid no particular attention to the frequent visits to the shed made by all seven of the swallows.

On September 1, however, upon noticing that the adult birds seemed to be carrying food into the shed, I examined the nest. To my surprise, it contained two young birds, appearing to be about a week old, and one addled egg. The average fall migration date for the species here, September 4, was nearly at hand, and the five young birds raised earlier in the season had left the ranch more than a week previously.

The following entries from my notes describe the successful completion of the late nesting venture, and indicate the difficulties attendant upon the feeding of young Barn Swallows here in September.

September 13.—Has been cloudy and cold for three days (max. temp. today 57°). Swallows have a hard time finding insects for themselves and their young (luckily there are only two young). Fly constantly from daylight till dark, ranging as far as 600 yards from the nest; visit the nest with food only once in fifteen to thirty minutes. I have been unable to see any insects in the air at any time during these three days.

September 15.—Clear, warm day. Young left the nest for the first time about 7 a. m.; remained outside almost all day, in flight much of the time.

September 16.—Young remained in the nest part of the day; were flying most of the afternoon.

September 17.—Young in air the greater part of the day.

September 22.—Swallows fly most of the day; young visit the nest occasionally, to rest. At night the young stay in the nest, and the two adults perch on the plank, beside the nest.

September 23.—Heavy rain fell last night, and continued all day. Swallows were in the shed in early morning, but soon disappeared; they were not seen again during the day, and for the first time did not return to the nest at night. Perhaps their migration has begun.

September 24.—Swallows not here at daylight, but appeared in the air about 8 a. m. Not seen again until 6:15 p. m., when they were flying about the shed. After dark I found them all at the nest, perching for the night. (No insects visible in the air yesterday or today.)

September 25.—Very frosty this morning. At 6:15 a. m., about an hour before sunrise, while the temperature stood at 26°, the four swallows flew out of the shed from the nest, circled the farmyard once, twittering, then struck out almost directly southward, in close formation, climbing as they flew. When they disappeared from view, a quarter of a mile distant, they were about 300 feet from the ground. Their delayed migration had begun.—WINTON WEYDEMEYER, Fortine, Montana, February 4, 1931.



**An Experiment in Staining California Gulls.**—While teaching in the Glendale High School of Glendale, California, in the spring of 1930, the writer noticed a flock of about forty California Gulls (*Larus californicus*) that often appeared on the school grounds in the middle of the morning and remained until mid-afternoon. These birds, of various ages, perched on the roof, flew about, and came on the ground to eat scraps left over from the students' lunches.

The problem at once presented itself: How far do these individual gulls range from Glendale and do the same birds return day after day? The writer had studied similar problems with several species of land birds at Stanford University, by staining the feathers distinctive colors, and he hoped to find the answer to the above questions by following the same method with the gulls. The stain would show very clearly on the white feathers, and as Glendale is in the heart of the Los Angeles area it seemed reasonable to suppose that many observations of the marked birds would be reported.

The California Gull is hard to capture and in fact only one was reported by the Biological Survey as being banded the previous year. After various unsuccessful attempts to trap these birds the writer succeeded late in the season with a drop trap, six feet square and three feet high, worked by a pull-string from a nearby window. The gulls ordinarily were very tame, but when the trap was set and baited they became wary and it was over a week before the first gull was secured.

Eleven gulls were captured from May 8 to May 16, 1930. They were banded with the numbers 530551-62 (omitting -60). In addition, the feathers on the breast and under the wings were stained a bright red with a stain formed by dissolving an artist oil-color (scarlet lake) in carbon-tetrachloride. This stain was developed by Dr. Wilbur K. Butts of Cornell University. (See Butts, Auk, XLIV, 1927, p. 329.) Several large syringe-fuls of the color were applied to each bird.

After being painted the gulls were at once released and flew rather heavily for a short time until the carbon-tetrachloride evaporated and then circled high overhead for several minutes. Then some flew away while others came to rest on the school roof. One remained there for over half an hour and was still there when the writer had to return to his classes. The other gulls on the roof did not molest it.

Four gulls were stained on May 9, at 12:30 p. m., and half an hour later one of them was seen on the roof of the Doran Grade School about three-quarters of a mile from the high school, and on May 16 two red gulls were seen at the Doran school ten minutes after being painted and released. Several teachers made these observations.

Contrary to the writer's expectations large numbers of the stained gulls did not return to the high school grounds. Only one came back. This one was seen perched on the school roof on May 20, at least four days after it was stained. The writer did not see it himself, but it was reported by several reliable students. The last large flock of gulls for the season appeared at the high school on May 20, and the last stragglers had left by June 1. Perhaps more returns would have been secured if this work had been carried on several months earlier.

Although the writer made several trips to localities frequented by gulls and notified the ornithological societies of his work, only two records of stained gulls were reported from outside of Glendale. On May 11, two days after banding, gull 530556 was found dead on the beach at Venice, California (17 miles from Glendale), by Mr. C. G. Vaughn who was unable to ascertain whether the bird had been shot or otherwise injured.

Miss Blanche Vignos saw one of the red gulls on May 18 (at least two days after staining) with other gulls on the water at Westlake Park, Los Angeles, about six miles from Glendale. She states that the stain was conspicuous, that the bird seemed normal, and that the other gulls did not persecute it.

It may be that further reports of stained gulls will even yet reach the writer. Although but few results were secured from this experiment, they show that this method of studying gull movements has possibilities.—JOHN B. PRICE, *Stanford University, California, January 5, 1931.*

**Black-necked Stilts Nesting in the Suisun Marshes, California.**—The first and only Black-necked Stilts (*Himantopus mexicanus*) which I have observed in the

marshes about the Suisun Bay were a pair feeding in the shallow water of a small pond at the side of the highway between Benicia and Goodyear, Solano County, on April 17, 1930.

This pair was still present when I drove by on three subsequent trips; but when I passed on May 7, I noted that only one bird was about. Thinking that they must be breeding, I took opportunity on May 14, to look them up more carefully, and soon located the pair along a slough across the railroad track about two hundred yards from the pond where they had previously been observed. One of the birds became much agitated at my approach; however, a fact which was rather surprising to me, its mate made no protest whatever, kept scouting about in the water at a considerable distance, and was seemingly unconcerned at my presence.

After a search about the vicinity where the noisy bird was calling and feigning injury, I located two downy young squatting with necks outstretched in about a half-inch of water at the edge of a puddle. I should judge they were between one and two days old; however, they already had comparatively long legs and necks; measurements made by setting one of the chicks on my notebook and marking the distance from heel to end of middle toe showed this length to be  $2\frac{1}{4}$  inches (57 mm.), and length of bill  $\frac{1}{2}$  inch (16 mm.).

After withdrawing to a distance, and while I was watching this odd and interesting family with my glasses, I noticed an occasional gull which flew over the young birds and looked down on them rather inquiringly, as though wondering whether the little fellows might not be suitable as an item of gull diet.—EMERSON A. STONER, *Benicia, California, February 3, 1931.*

**Eastern Fox Sparrow Trapped in Berkeley, California.**—On February 18, 1931, I trapped and banded in Strawberry Cañon, Berkeley, an Eastern Fox Sparrow (*Passerella iliaca iliaca*). The bird was given band no. 135626, and was then released. Since then it has repeated nineteen times, always in the same trap. From authorities consulted, this appears to be the sixteenth California record of a bird of this subspecies.—E. L. SUMNER, SR., *Berkeley, California, March 5, 1931.*

**Ground Nesting of Crows in Wyoming.**—On June 8, 1930, Mr. Otto McCreary, of the University of Wyoming, and I were making a preliminary survey of the



Fig. 30. GROUND NEST OF WESTERN CROW, ON PRAIRIE IN ALBANY COUNTY, WYOMING; JUNE 8, 1930.

bird life around one of the many small prairie lakes in Albany County, Wyoming. Our attention was attracted by a pair of Western Crows (*Corvus brachyrhynchos hesperis*). Their actions were those of breeding birds but there was not a tree or bush within sight, and within a radius of ten miles there seemed to be no possible nesting sites available except bushes which were not over five or six feet high. The crows' interest in the immediate vicinity persisted until finally I was convinced that they were nesting nearby. A careful search through the low sage and greasewood produced nothing, but the nest was found at last, located on the ground. (See fig. 30.) It was in the short grass, on flat, open prairie.

The nest was placed in a depression which at one time might have been the entrance of a badger hole. This depression was such that the rim of the nest was just level with the surface of the ground, and it was well filled with grass, weeds and small pieces of sage and willow. The nest had an outside rim of weeds, sage and willow twigs and a few small sticks and was lined with strips from weeds and with cow's hair. The general construction and bulk of the nest was about the same as any tree nest of the species. A few larger sticks and twigs were scattered around on the ground surrounding the nest. This nest contained seven eggs which appeared to be well incubated.—CAPTAIN L. R. WOLFE, Fort Warren, Wyoming, February 1, 1931.

**The Reddish Egret, a Bird New to the Avifauna of California.**—On February 12, 1931, while making a census of Black Sea Brant in this region for the California Fish and Game Commission, the writer and his companion, Frank F. Gander, observed a lone Lower California Reddish Egret (*Dichromanassa rufescens dickeyi*) on the tidal flats at the south end of San Diego Bay near Coronado Heights. The bird was just beyond the positive killing range of a shot-gun and it flew before the distance could be shortened. It was closely scrutinized through 6-power Zeiss binoculars by both observers and positively identified, the writer having had previous experience with Reddish Egrets in their haunts farther south, where he collected a number of specimens. A renewed effort was made the following day to locate and collect the bird but this was not successful.—LAURENCE M. HUEY, San Diego Society of Natural History, San Diego, California, February 14, 1931.

**A Seasonal Feast of the Willow Goldfinch.**—The principal roadway of the University Farm at Davis, California, is bordered on either side by a row of elm trees (*Ulmus pumila* var. *arborescens*) planted about twenty-two years ago, which have grown to goodly size and now provide grateful shade for man during the warm days of summer. The slender bare branches in winter and the foliage of summer are occasionally visited by birds in those seasons, but the principal ornithological interest is for a brief period each spring when the trees are the rendezvous of a large flock of Willow Goldfinches (*Spinus tristis salicamans*). The elms here put forth their diminutive blossoms in late February or early March, quickly followed by a dense clothing of "samaras", which grow, ripen, and fall as the leaves appear.

Goldfinches appear scattering in these trees at various times during the year, but the annual gathering comes just as the seed crop is "in the milk". In four years for which I have definite record the birds began or were at work on March 16 (1931), March 19 (1926), March 20 (1930), and March 25 (1929). Fully a hundred goldfinches were present in 1931.

The samara of this elm is a soft thin oval plate of tissue about  $\frac{1}{2}$  by  $\frac{3}{4}$  of an inch in surface dimensions, with a single seed at the center. These samaras are borne in dense clusters, often fairly clothing the branchlets. The goldfinches work in small companies, with seldom more than a dozen birds in any one tree, and the whole group is usually in a few adjacent trees. The birds seem to have decided preferences, as they pass by for a time some trees which are a little behind others in blossom time, and in any one tree they pick and choose among the seeds, taking one here, and another there. I could not see much if any difference in adjacent seeds on twigs taken at random. Early and late the birds are at their feeding, with little if any let-up during the midday hours, and there is a continuous chorus of small chipperings, with an occasional song, or flight notes as an individual leaves

or arrives. One year many of the goldfinches evidently roosted at night in a group of eucalyptus trees adjacent to the row of elms. The sidewalks and ground beneath the trees are littered with debris from the feast, fine bits from the samaras, occasional seeds or bits of seeds, and a few intact samaras loosened in feeding operations, while the whitish droppings spot the ground after a day or two of feeding in any particular tree.

At this season the goldfinches are beginning the spring molt, but only a few yellow feathers are in evidence when they are working in the elms. At times California Linnets join the goldfinches, and in 1929 there were two Pine Siskins present for several days.

During the remainder of the year the Willow Goldfinches are scattered about the valley country, in gardens or along the stream courses. Groups of moderate size are sometimes seen in other favorable feeding places, as on a Babylonian willow early in bud, or on the dried blossom heads of cosmos left by a bird-loving gardener in late autumn.

The regularity with which the goldfinches visit this ephemeral crop of the elms suggests that in some way the "news" is spread among the population and the birds quickly gather. Before the seeds are ready only scattering individuals are to be observed; but once the seeds reach the "milk" stage the birds assemble, and they continue in numbers until the food has passed beyond the range of palatability for them. The untouched seeds mature and turn brownish, the samaras whiten and shower down, and the goldfinches seek other feeding places until another year rolls around.—TRACY I. STORER, *University of California, Davis, March 30, 1931.*

**Behavior of Parent Killdeers.**—The following account of behavior of Killdeers (*Oxyechus vociferus*) was related to me by friends and seems worthy of record. They were driving east on the Alpine Hi-way above Pine Grove, in Amador County, when they noticed two little fledglings in the road. One of the ladies thought it a shame to leave such young birds alone and apparently without care, to the mercy of passing motorists, and consequently doomed to certain death. She accordingly stepped from the car, picked up the little orphans and, placing them in a pocket of her coat, carried them back, and the party proceeded on its way.

A gentleman of the party protested that it was murder thus to carry these little fellows away, that they could not live in captivity, and that even though they might survive, being the young of the killdeer, they would not sing.

The discussion continued for some miles up the road when it was decided to return the youngsters to the place whence they had been taken.

As the original spot was neared, both parents made for the car. When it stopped they both pecked savagely at the tires, and when the young were placed on the ground one bird, apparently the female, assisted the youngsters in making a most miraculous disappearance, while her mate continued a vicious attack on the front tires.—HENRY WARRINGTON, *Jackson, California, March 28, 1931.*

**Whistling Swans on Salton Sea.**—Early in December of 1930 my neighbor, Mr. Seth Hartley, told me of seeing three swans on Salton Sea. A few days later he saw presumably the same three birds fly over a blind, where they received a volley that caused one to fall in a field, where it was captured. It proved to be an adult female Whistling Swan (*Olor columbianus*) and seemed to be in a dying condition. But after a few days it seemed to be well on the way to complete recovery and would dive for food and swim around a reservoir with infinite grace. After a couple of weeks it began to fail, and on December 31, 1930, it died.

Robert Leatherman, the young man who was taking care of the bird for me, stated that the swan sang on the afternoon and evening of its death. The song was loud enough so that he could hear it while he was in his home about sixty feet distant. The song had absolutely no resemblance to any of the calls that the bird often gave and he could not describe it except to state that it was a real song and pleasing to the ear.

It is my opinion that the swans are accidentally shot by hunters who think they are "large geese". It behooves members of the Cooper Club to help educate hunters or these magnificent birds soon may be exterminated.—WILSON C. HANNA, *Colton, California, February 12, 1931.*

**Harris Sparrow in Berkeley.**—On February 10, 1931, a single Harris Sparrow (*Zonotrichia harrisi*) was observed by me on the campus of the University of California at Berkeley. It was associated with about twenty-five other Zonotrichias, mostly Nuttall White-crowned Sparrows, which as a flock daily forages on the lawns between Harmon Gymnasium and the Life Sciences Building. At the moment of observation, the Harris Sparrow was feeding by itself in a slight depression. It was recognized by black on top of head and on throat, and by light colored bill. The other Zonotrichias were foraging on grass which was being cut at the time by a motor driven lawn mower. In a few minutes something startled the flock which flew to the far side of the cut area; here the Harris Sparrow joined the Nuttalls and continued to feed with them. In silhouette it was like the Nuttall Sparrows, the narrow tail held straight out while feeding being a conspicuous character. In size it was slightly larger.—MARGARET W. WYTHE, *Museum of Vertebrate Zoology, Berkeley, California, February 25, 1931.*

**Two New Birds and Other Records for Lower California, Mexico.**—By consulting Grinnell's "Distributional Summation of the Ornithology of Lower California," published November 6, 1928, it is not a difficult matter to check a collection of birds from that region for possible range extensions or new migratory occurrences. While a great deal is known about the ornithology of the peninsula, yet it will be many years before a collection taken at points in the central or other remote areas will fail to develop new facts. It was the fortune of the writer, with two assistants, to visit this little known central portion of the peninsula during September and October, 1930. At that time the last of the southbound migration of land birds was passing and several noteworthy records were made. Modern equipment made possible stops of longer duration at points which had never before been well studied. The following are localities where camps were made, listed from north to south: San Agustín; Cataviña; 2 miles northwest of Chapala; 25 miles north of Punta Prieta; San Andrés; Santa Rosalía Bay. All are between latitudes 30° and 28° 30' north.

*Selasphorus rufus.* Rufous Hummingbird. Two females of this species were taken by S. G. Harter, one at San Agustín on October 2, 1930, and the other at Cataviña on October 6, 1930. At the latter locality a great field of Scarlet Bugler (*Pentstemon* sp.?) was in full bloom and dozens of hummingbirds were feeding daily. The most abundant species was the Costa Hummingbird, with a few Anna and two or three Rufous. Of the latter, one specimen was taken, which constitutes a fall record.

*Asyndesmus lewisi.* Lewis Woodpecker. An adult male of this species was collected at Cataviña on October 8, 1930, by S. G. Harter and is now no. 13678, collection of the San Diego Society of Natural History. The bird was first seen clinging to the trunk of a tall native fan palm and provides the southernmost record to date.

*Vermivora peregrina.* Tennessee Warbler. An immature male was collected from an arrow-weed patch near the waterhole at Cataviña on October 6, 1930, by E. H. Quayle. The specimen is no. 13965, collection of the San Diego Society of Natural History, and supplies the first record for Lower California.

*Dendroica palmarum palmarum.* Palm Warbler. An immature male of this species was collected from a small flock of *D. auduboni* two miles northwest of Chapala on October 16, 1930, by S. G. Harter. The specimen is now no. 13746, collection of the San Diego Society of Natural History. This bird was feeding in company with a small flock of *D. auduboni* in a dead weed patch and was noticed by reason of its peculiar wing jerking movements when perched. Its capture provides the first published record of this species for Lower California.

*Piranga rubra cooperi.* Cooper Tanager. A single immature female of this species was taken from the stone corral at Santa Rosalía Bay at dawn on October 19, 1930, by Laurence M. Huey. It is now no. 13527, collection of the San Diego Society of Natural History, and represents a fall coastwise record.

*Amphispiza belli nevadensis.* Nevada Sage Sparrow. Three specimens of this sparrow were collected from a flock of about a dozen at San Andrés on October 21 and 23, 1930, by Laurence M. Huey. As is characteristic of this bird, the flock



was found in a heavy growth of fairly low growing desert brush and apparently was there to spend the winter. This point of capture is by far the southernmost record station to date and the nearest to the Pacific Ocean known to the writer.

*Junco oreganus townsendi*. Townsend Oregon Junco. This sedentary species seems not prone to leave its mountain habitat and it was with some surprise that a single immature male was collected at San Agustín, October 29, 1930, by E. H. Quayle. The specimen is no. 14078, collection of the San Diego Society of Natural History. While San Agustín is not a very great distance south of the Sierra San Pedro Mártir, the habitat of *J. o. townsendi*, the taking of this specimen represents the farthest distant winter station yet recorded.

*Spizella pallida*. Clay-colored Sparrow. This bird is a common winter visitant in the Cape District. The taking of a single female specimen at Cataviña on October 7, 1930, by S. G. Harter, brings its range well north of the center of the peninsula. The specimen is no. 13661, collection of the San Diego Society of Natural History.—LAURENCE M. HUEY, *San Diego Society of Natural History, Balboa Park, San Diego, California, February 25, 1931.*

**Some Banded Birds Recaptured after Five to Seven and One-half Years.**—The following records are all of birds banded in Strawberry Cañon, Berkeley, California, by Mr. E. D. Clabaugh, and recaptured by me in the same cañon.

On February 2, 1931, I trapped a San Francisco Spotted Towhee (*Pipilo maculatus falcifer*) wearing a band numbered 116501. Mr. Clabaugh told me that this towhee was trapped originally by him on August 23, 1923, as a juvenal, and that it was the first bird he ever banded. The band was badly worn, and I replaced it by A267650.

On January 11, 1931, I trapped a Spotted Towhee, 240781, originally banded by Mr. Clabaugh on June 21, 1924. This band also was badly worn, and was replaced by A267634. On February 5, I captured another Spotted Towhee, with a badly worn band, a portion of which had broken off, carrying with it the first two digits, leaving the figures 2099. Mr. Clabaugh supplied the missing digits, which showed that the number was 242099, and told me that he had trapped it on November 11, 1924. This band was replaced by A267654.

A Golden-crowned Sparrow (*Zonotrichia coronata*), originally banded by Mr. Clabaugh on February 7, 1926, was taken by me on January 13, 1931. This band, 161447, was in good condition.

A Fox Sparrow (*Passerella iliaca* subsp.) was trapped by me on November 20, 1930, bearing a band numbered 139440, which was placed on the bird by Mr. Clabaugh February 22, 1925. This band also was in good condition. In contrast with the worn bands of the towhees, scratching birds, was band 91519, on an Intermediate Wren-tit (*Chamaea fasciata fasciata*), a non-scratching bird, recaptured by me on February 3, which was bright and shiny and appeared quite new. Yet this bird was banded by Mr. Clabaugh on March 22, 1925.—E. L. SUMNER, SR., *Berkeley, California, March 5, 1931.*

**Some Recent Records from Lincoln County, Montana.**—Long-billed Dowitcher (*Macrorhamphus griseus scolopaceus*). One bird of this species was observed on August 10 and two on September 3, 1930, at Dry Lake, near Fortine. My only previous record for Lincoln County is that of one bird seen at Barnaby Lake, in the same vicinity, on August 13, 1927.

Western Lark Sparrow (*Chondestes grammacus strigatus*). One bird was seen on August 21, 1930, at our ranch near Fortine; on the following day two were seen. I had not previously observed this species in Montana west of the divide.

Clay-colored Sparrow (*Spizella pallida*). One bird was seen at our ranch on September 8, 1930. Having observed this species quite commonly elsewhere, I had no doubt as to its identity, especially as I was able to examine it for half a minute from a distance of about six feet. There seem to be no published records of the occurrence of this species in Montana west of the divide.

Tennessee Warbler (*Vermivora peregrina*). A young bird of this species was seen near Fortine on September 11, 1930. My only certain previous record is that of a bird observed in the same locality on May 14, 1929.—WINTON WEYDEMAYER, *Fortine, Montana, February 9, 1931.*



**The Western Tanager Wintering in Southern California.**—A small flock of Western Tanagers (*Piranga ludoviciana*) has spent the winter in the trees on the grounds of the Deane School in Montecito, near the city of Santa Barbara. The situation is a favorable one for birds. An open grass oval of perhaps three acres in extent is completely surrounded by a dense but shallow woods composed of many varieties of trees, pines, cypress, eucalyptus, oaks, acacia, and many others.

The birds arrived in a loose flock early in November and at the present writing (February 10, 1931) are still present. How many birds compose the flock is uncertain, because they usually appear in widely scattered formation. On some days only a single bird is seen at any given time; on other days two or three are noted. One day they seemed to be in the trees all about the grass oval and, from the noise made, gave the impression of a dozen or more active, feeding birds; all were in the tops of the trees. Hardly a day goes by that at least one bird is not heard.

At least three different phases of plumage have been definitely recognized: full plumage with full red head, an intermediate plumage (the specimen taken on the 3rd of February and now no. 1572 in the Santa Barbara Museum of Natural History) with but a slight washing of red about the forehead, which, in the high trees, was unnoticeable to the unaided eye, and a full eclipse plumage. Perhaps there are from six to ten birds in the flock; perhaps a few more. The call is the familiar and unmistakable *purrr-urr-up*.

One thing that is especially noticeable in these birds is the regularity of their habits; almost every afternoon at about four o'clock a dark bird, in eclipse plumage, takes up its position in an old, low-growing oak at the northwestern curve of the oval and for perhaps half an hour, with but few intervals of silence, gives its call or song. The specimen taken had a more or less clearly defined route through the tops of the higher trees, that it followed more or less regularly as to time, arriving at the Senior Dormitory about nine o'clock in the morning; but this bird was not seen with the same regularity as has been the first mentioned bird. The bird in full plumage, usually in the high tree tops, has not been seen since the first of the year.—E. S. SPAULDING, *Deane School, Montecito, California, March 24, 1931.*

**The Most Western Record of the Indigo Bunting.**—In a collection of birds obtained for the San Diego Society of Natural History by S. G. Harter, who, during July, 1930, was engaged in field work in the Huachuca Mountains of southern Arizona, is an adult male specimen of *Passerina cyanea* (Linnaeus). The bird was taken well up in Ramsey Canyon on July 13, 1930, and is now no. 13333, collection of the San Diego Society of Natural History. Dissection proved it to be in post-breeding condition and it was evidently on its southern migration. This marks the most westerly point of capture for this species and adds a new bird to the avifauna of Arizona.—LAURENCE M. HUEY, *San Diego Society of Natural History, Balboa Park, San Diego, California, February 25, 1931.*

## EDITORIAL NOTES AND NEWS

The Third Ten Year Index to the Condor (volumes 21-30, 1919-1928) was issued on April 15, 1931. It consists of 152 pages, 146 of which are double-column, in 8-point type. This means that there are 17520 lines; these lines averaging  $4\frac{1}{2}$  words, volume numbers and (or) page numbers each, thus include approximately eighty

thousand such items! Think of the work this has meant on the part of the author, Mr. George Willett! This painstaking service has been rendered so as to make easily available to students of birds the information, of great amount and wide variety, which has found published record in our magazine in the third ten-year

period of its existence. These ten volumes contained a total of 2587 royal octavo pages. It is now important that every active, serious bird student have right at hand, for his own full benefit, the results of Mr. Willett's work, done by him gratuitously in the common interest. To this end, orders for copies should be sent promptly to Mr. W. Lee Chambers, 2068 Escarpa Drive, Eagle Rock, Los Angeles.

Mr. James Moffitt, Research Assistant, Bureau of Education and Research, California Division of Fish and Game, is engaged this year in making a survey of the breeding grounds of water fowl in California. With the help of other members of the organization he is also trying to get a fair estimate of the numbers of ducks and geese which are now breeding within the state. All this information will be used in determining practicable ways of increasing the "home-supply" of wild water fowl.

"Familiar Birds of the Stanford Campus" is the title of a booklet that has just appeared from the Stanford University Press (about crown 8vo [120 x 170 mm.], pp. viii + 72, our copy received March 11, 1931). The author, Mr. John B. Price, has planned this book solely, as he states in the Preface, "to help the person interested in birds to learn the names of the more common ones at Stanford and to encourage him to pursue the subject further in the many excellent bird books available." With this worthy aim in view, Mr. Price presents a field key to the common campus birds, brief accounts of about twenty of the more familiar species, some suggested "bird walks", and a list of Stanford birds, the latter "taken largely from note-books of beginning zoölogy students" under instruction of Prof. J. O. Snyder. As a beginner's guide this offering looks to us to promise an unusual measure of success. Incidentally we note that the design of the type used, one "made especially for easy reading while walking, is by Hartley Jackson." This, as far as we can recall, is novel as an advance in book printing, certainly an innovation to be welcomed.—J.G.

Mr. J. A. Munro, Chief Federal Migratory Bird Officer for the Western Provinces of Canada, found it necessary to meet, with facts, the growing complaints of both commercial fishermen and

anglers in his territory against birds of certain aquatic species. To this end, Mr. Munro, and his colleague Mr. W. A. Clemens, undertook a special study of the food habits of water fowl during the spawning season of herring in the vicinity of Departure Bay, British Columbia. The results of this study are set forth in detail in a recent pamphlet entitled "Water Fowl in Relation to the Spawning of Herring in British Columbia" (Bull. No. xvii, The Biological Board of Canada, Toronto, 1931, 46 pp., 7 figs. in text). Much good natural history is given, most interesting of which to us relates to the formation and constitution of pellets in sea-gulls. In conclusion the authors find themselves not justified in urging campaigns against any of the water fowl. In view of the enormous natural wastage of herring eggs and considering also the present great annual catch of herring by commercial fishermen, the specific complaint that the consumption of eggs by ducks has caused a shortage of herring is not substantiated.—J.G.

The Brodie Club, an organization of professional and amateur naturalists in Ontario, has recently issued a four-page publication stating its attitude on some of the controversial points concerning birds of prey. The immediate stimulus for this publication was one on the same subject sent out early in March, 1931, by Mr. Jack Miner. The point of view of the Brodie Club is indicated in the following statements that head paragraphs. "Jack Miner's 'Facts about Hawks' is not based on results of stomach analyses." "Nearly three-quarters of the hawk stomachs analyzed for Jack Miner were of three kinds known to feed largely on birds." "Unfair to condemn 'hawks' on evidence, nearly three-quarters of which was secured from species widely recognized as the destructive minority." "Jack Miner's 'evidence' casts suspicion on only one hawk generally thought to be useful." "Jack Miner's 'evidence' more favourable to some hawks than had been suspected." "Public unaware of Jack Miner's favourable view of some kinds of hawks." "Jack Miner believes some hawks are destructive; the Brodie Club believes some hawks are useful." "Because of Jack Miner's reputation as a bird conservationist, the general opinion that he is opposed to all hawks is very regrettable." "Jack Miner mistaken in saying birds of prey not de-

creasing in numbers; some species face extinction." "Small birds receive almost universal protection; large birds, and especially hawks, are killed on sight by almost everyone who carries a gun." "Mr. Miner's estimate of relative abundance of hawks and small birds obviously wrong." "Our point of view affects the value we place on birds; personal opinions cannot rule." "It is illogical to accuse a hawk of cruelty because it gets its living as nature intended it to get it." These views, it appears to us, are sound. If any *Condor* reader wishes further information as to the situation in Ontario, he should communicate with the Brodie Club, whose secretary is Mr. R. J. Rutter, 20 The Maples, Bain Avenue, Toronto, Canada.—J.M.L.

Nearly one hundred years ago, discussions were going on, of astonishingly similar character to those taking place right now concerning the use of vernacular names of birds. Let Dr. Stone (see January *Auk*, p. 143) and all the rest of us, present-day debaters on this subject read the following and be chastened! William MacGillivray wrote in 1837: "As to English names, very little needs be said, further than that, were the genera positively fixed, which they cannot be for many years, if ever, it might be well to give them vernacular names, in which case each species ought in like manner to have a distinctive epithet or substantive name. Thus, we shall suppose a genus named *Corvus*, to consist of five species named *Corax*, *Corone*, *Cornix*, *Frugilegus*, *Monedula*. The English generic name being *Crow*, we might name the species *Raven Crow*, *Carriion Crow*, *Hooded Crow*, *Rook Crow*, *Daw Crow*. But in all cases single substantive specific names would be the best: for example, the *Raven*, the *Corby*, the *Hoody*, the *Rook*, the *Daw*. Some person proposes a general meeting of British Ornithologists at London, York, or Edinburgh, for the purpose of determining the English nomenclature of our native birds; but such a meeting, were it to take place, would disperse without accomplishing the object in view, unless indeed its members were placed on the *Bass Rock*, and interdicted fire and food until they had settled all their differences, and sworn perpetual friendship. Even then, some malicious Celt, capable of subsisting a month on dulse and tangles, with an occasional raw limpet or mussel, might hold out until, rather than be starved, the

philosophers should leave the birds to him to do with them as he pleased. In sober earnest, it is impossible to remedy the acknowledged defects in nomenclature, so as to render it universally acceptable. Some persons who do their best to render the subject still more intricate, are extremely sensitive on the point of uniformity; but, in my opinion, however much they who are ambitious of being legislators in this matter may desire conformity to their views, there will always be more to spurn the yoke than to yield to authority, which is gradually falling to its proper standard. In fact, no two ornithologists have ever used the same names for five hundred birds; nor could two be found who should employ the same nomenclature in describing even the birds of Britain. There is really no cause of regret in all this: were there no differences in politics, religion, and science, the world would probably be much worse than it is. I am therefore under the necessity of using my own discretion in bestowing English, Gaelic, and Latin names on the birds which I propose to describe; and I request that my readers scruple not to reject whatever they find indicative of bad taste or bad feeling" (MacGillivray, *History of British Birds*, 1, 1837, pp. 9-10).

**WHOLESALE POISONING OF WILD ANIMAL LIFE.**—It is with a peculiar feeling of despair that we read the statement of findings summarized by Dr. Linsdale in his article published in the present issue of *The Condor*. His findings show that over one-third the area of California is being subjected to repeated applications of a poison, to kill ground squirrels, so insidious and far-reaching in its effects as to threaten the existence within that whole area of important native birds such as mourning doves and valley quail, as well as, secondarily but even more certainly, of carnivorous birds and mammals generally. And this has been going on, under State and Federal authorization or recommendation, despite our frequent solicitous enquiries of those agencies as to the harm suspected, until a stage has been reached when the malignant situation must be made known to the public through private initiative, in the hope that the practises will be discountenanced.

There is a certain administrative type of mind to which the human "use" of all natural resources and the correlated elimi-

nation of anything which looks to be detrimental, or even not immediately and clearly of value, loom as the only "practical" aims. Dr. Linsdale refrains from giving much in the way of conclusions in his paper, leaving it for each of his readers to make interpretations suitable to his own understanding. However, we feel so apprehensive on the subject that we yield to the temptation to comment on our own part on some of the more obvious implications.

The total area poisoned in the year ending June 30, 1929, was over 5,000,000 acres (10th Annual Rept., Calif. Dept. Agric., December, 1929 [issued in 1931], p. 792); 558,000 pounds of grain poisoned with thallium were scattered. In one year, 1928, over two million pounds of poisoned grain were used. The behavior of thallium-poisoned animals is such that few dead animals come to the attention of the human observer, perhaps much less than one per cent. But even so, 116 witnesses report over 5000 dead animals identified and counted on less than one per cent of the total area poisoned. We can figure from this that in the last four years not less than 50 million animals other than ground squirrels have been killed in California through these operations! As to the money cost of such poison campaigns, \$812,478 were spent in California in the year 1930 for rodent control alone.

Now all this destruction of our higher vertebrate animals is done in the interests of but a part of the human population. Indeed, close analysis of the many angles in the problem leads to the query whether this expenditure has not been a total waste economically,—not only that but has involved a positive loss besides!

The pity of it is that these campaigns of destruction are carried on "in cooperation with" the Biological Survey, a governmental organization which we were brought up to believe, upon the best of grounds, was consecrated to the practice and encouragement of real conservation, and nothing else. While much of the work of this Bureau remains truly conservation in character and is thus to be highly commended, there has crept in of late years this insidious tendency toward a "practical" type of "conservation", which means saving profits for those groups of persons whose financial interests can be benefited by "control" (that is, extermination) of wild animal life.

It is a curious perversion, surely, when "conservation" is appealed to to justify destruction.

In our mind, at the present moment, the wholesale poisoning of wild animal life (birds, carnivorous mammals, rodents) on uncultivated terrain, ought to cease; not only that, but it should be prohibited by law. The first step to be sought is the stoppage of the use of thallium; and what is needed here is to reach those governmental authorities who are willing to heed facts and to act in the interests of people at large, not in the interests only of small though potent minorities. Read Dr. Linsdale's report; then if your conscience directs, exert your personal influence toward stopping this destruction of our wild animal life.—J. GRINNELL.

#### PUBLICATIONS REVIEWED

BANNERMAN'S BIRDS OF TROPICAL WEST AFRICA.\*—We have picked this book for review because, first of all, the preliminary glance we gave it aroused our interest and second because we had already from time to time wanted to know about the birds of West Africa and here was a chance to gain ideas from a recognizedly authoritative source. From the latter point of view, therefore, what does the work in question offer as meeting the enquiry of a student already equipped with a knowledge in general ornithological science but who lacks entirely any first-hand knowledge of Old-World birds and who even has read but little concerning the bird life of West Africa?

Such a student will ask first for concise information concerning the general distribution of the bird life of the entire territory and then for the descriptions of the critical conditions which control the existence of species in different parts of the territory. These questions are answered in satisfying measure by Bannerman's chapter on "the relationship of the vegetation belts to the distribution of bird life in Tropical Africa." This chapter is illustrated by finely reproduced

\*The | Birds of Tropical West Africa | with  
Special Reference to those of the Gambia, | Sierra  
Leone, the Gold Coast and Nigeria | By | David  
Armitage Bannerman | [etc. 8 lines] | Volume  
One | Published under the Authority of the |  
Secretary of State for the Colonies by | The  
Crown Agents for the Colonies | 4 Millbank, West-  
minster, London, S.W.1 | 1930 [our copy re-  
ceived June 26]. Crown 4to, pp. lxxvi + 376,  
10 pls., 119 text-figs. Price 22s 6d for this vol.;  
of the entire 5, as issued, plus postage, £5, 7s, 6d.

maps of the belts (or zones) of vegetation and of the avifaunal districts. Study of these at once gives explanation of the numbers as well as locations of the species in the different systematic groups of birds dealt with subsequently in the work. For, perhaps not yet often enough enunciated as a working principle, the avifauna of a region in its variety and kinds is a direct function of environment in its variety and kinds.

After well illustrated general keys, the birds of the region are taken up and given routine treatment on an organized plan for each as follows: A full and truly significant English vernacular name is selected for the heading; for example, "The North Atlantic Great Shearwater" for the bird which is given, with regretfully no significance to the lay reader, in the A.O.U. Check-List as "Cory's Shearwater." Then follows the scientific name, carefully determined as to subspecies, frequently with footnote giving definitely the ground for its employment, especially where there has been difference of usage in recently preceding literature; then a selected set of citations to the literature; then French, German and native names, where known. The description of the species or subspecies is concise, but seemingly adequate, supplementing the "key" characters already given for each family and higher group. Then, in large type are given the chief marks for field identification, a statement of range, and, of varying greater extent, up to several pages, an account of habits.

The illustrations throughout the present volume have been well chosen as appropriate to the purpose of the book, are abundant, and are of high merit ornithologically as well as, at least in the case of the plates, artistically. There are, not including many line drawings accompanying the general keys and the introductory matter, 119 text-figures and ten colored plates; two of the latter are the maps already referred to, eight of birds painted by the late Major Henry Jones. The drawings in the text, wash and line, are from brush or pen of a number of artists including Grönvold, Frohawk, Green, and Tenison.

As indicating the nature and often exceeding interest of the statements of habits, here are a few examples. Of the Northern Secretary-Bird (p. 169): "In killing its prey [snakes, rats, frogs, etc.] the bird uses its feet as a sledge-hammer, striking forwards and pounding its luck-

less victim to death. One realizes the force of the crushing blows delivered with the bird's foot once one has heard the noise of the stamping when a snake is being killed—a noise which can be easily heard at a considerable distance." Of the West African Sea-Eagle (p. 270), a not distant relative of our Bald Eagle: "Fish are, of course, its stable food, and these are caught by the eagle as it flies over the surface, but occasionally a bird will wade into the shallows and seize small fish imprisoned in pools. When occasion permits, it robs its less powerful associates—Pelicans and Cormorants—of their spoils." Of the female Pintail (p. 148), same species, though slightly differing subspecies, as our American bird: "The Pintail rides lightly on the water in comparison with the Mallard, which sinks its body much lower, a character which is even more strikingly exemplified in the drakes." We do not recall this field diagnostic character having been pointed out in our American literature.

We observe, of gratification to the American ornithological fraternity, that Bannerman gives frequent testimony to the soundness of the work that James P. Chapin is doing in Africa. When, of two qualified men working in a region independently, the one (or the other) finds reason repeatedly to concur in the conclusions of the other, we are doubly assured of the correctness of such conclusions.

A chapter on the ornithological history of the region is supplemented by a selected bibliography of 72 titles of articles and books relating to West Africa, classified by geographical subdivisions.

West Africa is so pictured bird-wise by Bannerman as to be most alluring to a person tempted to undertake zoological exploration abroad. Again and again it is made clear that very much good fundamental faunistic and systematic work remains to be done in that region of the Earth. He says (p. xiv): "Naturalists who find themselves in West Africa need not allow time to weigh heavily on their hands!"

All in all, we consider the plan and execution of Bannerman's *Birds of Tropical West Africa* commendable in high degree. With the completion of the entire five volumes serious bird students will be supplied with a well-nigh ideal manual for that territory. Of incidental remark, we need for North America a work of similar plan and execution, which curious-



ly we do not now have despite the great number of bird books appearing on the market year by year. The nearest approach is Coues' Key, but this work is now far out of date as regards its systematics.—J. GRINNELL

### MINUTES OF COOPER CLUB MEETINGS

#### NORTHERN DIVISION

**FEBRUARY.**—The regular monthly meeting of the Cooper Ornithological Club, Northern Division, was held on February 26, 1931, at 8:00 p. m., in Room 2003, Life Sciences Building, University of California, Berkeley, with sixty members and guests in attendance. President George M. Wright occupied the chair. Minutes of the Northern Division for January were read and approved; minutes of the Southern Division for January were read.

Dr. E. R. Hall reported having received in the latest mail a letter from H. E. Anthony, Chairman of the Special Committee of the Society of Mammalogists, stating that the Predatory Animal Control bill had been passed by the House of Representatives and urging all those opposed to the bill to communicate their protests at once to Hiram W. Johnson and Samuel M. Shortridge, Senators from California. The secretary reported that, through the kindness of Mr. W. I. Follett, Assemblyman Charles W. Fisher of Oakland had become interested in the campaign to make the California Valley Quail State Bird and had on January 21, 1931, jointly with Assemblywoman Eleanor Miller of Los Angeles, introduced such a bill into the State Legislature. This bill, no. 776, is now in the hands of the Committee on Governmental Efficiency and Economy. Mr. B. C. Cain announced that Mr. Chase Littlejohn would address the March meeting of the Audubon Association of the Pacific upon "Birds of the Far North" and invited Cooper Club members to attend the meeting. He also stated that on the first, second, third and fifth Thursday evenings of April the Association will hold open meetings in the auditorium of the Pacific Gas and Electric Company in San Francisco, with the desire more fully to acquaint the public with our native birds.

Mr. Ben H. Thompson reported upon a trip through the Florida Everglades taken recently in company with Mr.

Wright. Most of the day was spent in the marshy portion where palms crowned the grassy hummocks; birds seen were Kingfishers, large flocks of Wood Ibis, Egrets by the thousands, Great Blue Herons, Louisiana Herons, a single Great White Heron, Water Turkeys, Marsh Hawks, five Glossy Ibises, small flocks of White Ibis and, when the day's end brought them to the mangroves along the coast, large flocks of Brown Pelicans against the sunset sky.

Mrs. Bracelin told of seeing a flock of forty-four Whistling Swans feeding on the flat north of the Sears Point cut-off, Napa County, California, and Mr. Charles Bryant reported about ten thousand Brant at the mouth of Tomales Bay, where he also saw seven Harlequin Ducks and eight Marbled Murrelets. Cranson Hopkins stated that he had seen a pair of Hooded Mergansers near the island in Lake Merritt. Mr. Grinnell voiced a vigorous protest against the maintenance on Lake Merritt of pinioned exotic ducks, barnyard breeds, and cripples, believing that the sanctuary would best serve its purpose if reserved for the free-flying wild fowl which come of their own volition. Mrs. Mead told of seeing a White-throated Sparrow on a feeding table kept by Mrs. Leavens who said the bird had visited the table daily since October. Mr. Cain reported the presence of a Slate-colored Junco, together with Oregon Juncos, in a group of twelve species about the feeding table at the Oakland Boy Scout Camp. Miss Stedman contributed a note upon the presence of a flock of forty Cedar Waxwings at her home on Howe Street, together with a Spotted Towhee, a species not usually seen so near the center of Oakland.

Dr. Gayle B. Pickwell of the San Jose State College provided the evening's program, a series of beautiful lantern slides of birds and flowers of the upper slopes of Mount Rainier, illustrating the life histories of the Pipit and White-tailed Ptarmigan, which species nest within the glacial cirques of the Arctic Zone, a fascinating region beyond the reach of most Club members.

Adjourned.—HILDA W. GRINNELL, Secretary.

**MARCH.**—The regular monthly meeting of the Cooper Ornithological Club, Northern Division, was held on Thursday evening, March 26, 1931, at 8:00 p. m. in Room 2003 Life Sciences Building, Uni-



versity of California, with about sixty members and guests present and President George M. Wright presiding. Minutes of the Northern Division for February were read and approved. Minutes of the Southern Division for February were read.

Proposals of new names for membership were: Ernest I. Dyer, 40 Selborne Drive, Piedmont, Calif., by W. F. Sampson; Wilfrid T. Frost, 2136 Grant St., Berkeley, Calif., by E. R. Hall; Mrs. D. Lorraine Roberts, 1785 Spruce St., Berkeley, Calif., by Margaret W. Wythe; Robert T. Orr, 759 31st Ave., San Francisco, Calif., by Donald McLaughlin; Ben H. Thompson, 405 American Trust Bldg., Berkeley, Calif., by Joseph Dixon.

Mr. Dixon who has been a representative from the Cooper Club to the Associated Sportsmen announced that the latter organization has raised the dues of affiliated societies to fifty dollars per annum and stated that he would recommend to the Board of Governors that the affiliation be discontinued. Mr. Swarth reported upon the progress of the fourth ten-year index to the *Auk* and stated that it would perhaps be ready for the printer by the coming New Year. Mr. Grinnell announced that the third ten-year index to the *Condor*, compiled by Mr. George Willett, should be off the press by the middle of April. Mr. Marshall Jencks, representing the Audubon Association of the Pacific, cordially invited Cooper Club members to attend the evening meetings to be held by this organization on the first, second, third and fifth Thursday evenings in April, at the Auditorium of the Pacific Gas and Electric Company, 245 Market St., San Francisco. At President Wright's suggestion Mr. Alden Miller reported upon plans for the annual meeting of the Cooper Club, to be held on May 15 to 17. Mrs. H. J. Taylor reviewed briefly her attendance at the annual meeting of the Wilson Ornithological Club, and she told of birds seen from the train as she came back West.

Mr. George Tonkin of the Biological Survey spoke of the unusual numbers of swans present this winter and of the fact that hunters sometimes shoot them in the early morning, mistaking them for geese. He told also of the exaggeration and distortion by newspapers of reports concerning game and cited several examples. Mr. Mailliard spoke of the continued scarcity of birds in Marin County. Miss Selma Werner reported upon a winter

visit to Phoenix and Scottsdale, Arizona, and upon the thrill of seeing and hearing new bird species. Mr. Wright told of seeing an agitated flock of about 150 Cedar Waxwings in a North Berkeley park recently and of finding upon his nearer approach one of the birds in the mouth of a cat.

Mr. E. W. Ehmann of Piedmont spoke upon "the banding of ducks at Lake Merritt." His talk was so full of interest that the Secretary has attempted to report upon it in some detail.

Mr. Ehmann's banding experiments were begun January 23, 1926, at which time he banded 243 ducks. Since then he has banded birds each winter until now his records show a total of 3592 banded birds distributed as follows: Sprig, 2813; Widgeon, 511; European Widgeon, 1; Spoonbill, 11; Mallard, 14; Mudhen, 220; Brant, 2. The European Widgeon is a male and has returned to the lake the last three winters, being the individual familiar to all local students; no mate has been recognized. Of the birds banded, 339 have been killed in various places and the bands returned. Ducks banded at Lake Merritt have been taken in ten different states, Alaska and Canada, and one individual in Mexico. Oakland City Park employees reported that the year before banding began female ducks were most plentiful on the lake, but during the past five years male ducks have been the most plentiful by far, almost three males to one female, in spite of the fact, pointed out by Mr. Tonkin, that duck hunters when possible prefer to take males. Most of the banded ducks, aside from the 255 taken in California, have been reported from the North, 20 having been taken in Alaska, 24 in Alberta, and 7 in Saskatchewan.

Incidentally, as Mr. Ehmann pointed out, it seems only fair that Oakland should feed the ducks since they advertise the city far and wide. Cameramen from all the leading cinema firms have photographed the ducks feeding or being banded and the films have been shown in fourteen thousand theaters and to audiences estimated to total twenty million persons.

Adjourned.—HILDA W. GRINNELL, Secretary.

#### SOUTHERN DIVISION

FEBRUARY.—The February meeting of the Southern Division of the Cooper Orni-

thological Club was held on Tuesday evening, February 24, 1931, at the Los Angeles Museum, Exposition Park, Los Angeles, with President Pemberton in the chair and about twenty-five members and friends present. The minutes of the January meeting of the Southern Division were read and approved. The minutes of the December and January meetings of the Northern Division were read.

The application for membership of Ed. N. Harrison, Box 324, Encinitas, California, proposed by J. R. Pemberton, was read.

A letter was read from J. Murray Luck, Secretary of the Pacific Division of the American Association for the Advancement of Science, in regard to participation of the Cooper Club in the meeting to be held in Pasadena, June 15-20, 1931. It was moved by Dr. Loye Miller that the Cooper Club meet in conjunction with the Western Society of Naturalists on that occasion, and that the Secretary be instructed to notify Mr. Luck to that effect. The motion was seconded by Raymond B. Cowles, and was carried.

A letter was read from Senator Frederic C. Walcott, Chairman of the Special Committee on Wild Life Resources, asking for comments and suggestions on a report of this committee that was read before the Senate on January 22, 1931. It was moved by Dr. Loye Miller that the report be submitted to Joseph Dixon and George Wright. The motion was seconded by George Willett, and was carried.

Discussion was started by Harold Michener as to the present status of the Conservation Committee of the Cooper Club and the Secretary was asked to correspond with Tracy I. Storer to find out if the committee is still active and if the Southern Division should appoint one or more members to the committee. No formal action was taken.

The following resolution was read:

Whereas, it has pleased an all-wise Providence to remove from our midst our friend and fellow-worker, Dr. Edward C. Bull; and

Whereas, the work of Dr. Bull in teaching the youth of southern California to appreciate the beauties of nature has been a strong influence toward clean living and good citizenship; and

Whereas, those who have been in contact with him have been brought to appreciate his ability as a teacher, his intense interest in the study of nature, and his readiness at all times to help any worthy cause; therefore, be it

Resolved, that the Southern Division of the Cooper Ornithological Club feels deeply this loss to the Club and to the community at large, realizing that the passing of Dr. Bull leaves a vacancy that will be difficult to fill; and, be it further

Resolved, that these resolutions be placed on the

minutes of the Club, and that a copy be sent to the bereaved family of our friend.

Signed: J. R. Pemberton, President; John McB. Robertson, Secretary.

Dr. Loye Miller moved the adoption of the resolution, the motion was seconded by George Willett, and it was carried unanimously.

Harold Michener referred to the report at a recent meeting, by Mr. Clary, that airplanes are sometimes used in the Salton Sea region to scare the ducks so that they will go to the gun clubs where they may be shot. He had spoken of this to Mr. Frederick C. Lincoln recently in Washington and Mr. Lincoln had shown him a copy of the law that declares this use of airplanes to be illegal.

The Secretary explained that Dr. E. W. Nelson had prepared to address the meeting on the predatory animal control work of the Biological Survey, thinking that the resolution passed at the December meeting was still pending before the Southern Division, but upon finding that action had been taken at the December meeting he asked to have the engagement cancelled, since because of his recent illness he did not care to talk on another subject at the present time.

Dr. Loye Miller reported that the fossil birds recently taken from the second horizon of the Carpinteria asphalt pits indicate a wooded and perhaps mountainous environment, differing from the Rancho La Brea deposits more in ratio than in species, however. He also spoke of the color of the eye-shine of owls.

Harold Michener spoke of having recently seen Dr. Wetmore and Mr. Lincoln in Washington, and he reported that they were preparing for a collecting trip to Haiti. The coming Annual Meeting was mentioned by Dr. Miller. George Willett spoke of the scarcity of birds seen on recent desert trips, and of how few hawks he had seen. C. O. Reis spoke of birds seen near Palm Springs and Twenty-nine Palms; of particular interest were Scott's Orioles, seen near Twenty-nine Palms on February 22. J. R. Pemberton spoke of birds seen on a recent trip to San Clemente Island.

Attention was called to a display of lithographic reproductions of paintings of Abyssinian birds and mammals by Louis A. Fuertes, some of the last and also some of the best work of that well known artist.

Adjourned.—JOHN MCB. ROBERTSON, Secretary.





**For Sale, Exchange and Want Column.**—Any Cooper Club member is entitled to one advertising notice in each issue free. Notices of over ten lines will be charged for at the rate of 15 cents per line. For this department, address JOHN MCB. ROBERTSON, Buena Park, California.

**WANTED**—The following volumes: Dana, J. D., 1852-53, Crustacea, Parts 1, 2, in United States Exploring Expedition, vols. 13, 14, pp. 1-1620; Folio Atlas with 96 Plates, 1885.—STEVE A. GLASSELL, 9533 Santa Monica Blvd., Beverly Hills, Calif.

**FOR SALE**—Preliminary Catalog of the Birds of Missouri, by O. Widmann, price \$3.00 per copy.—The SECRETARY of the Academy of Science, Washington University, St. Louis, Mo.

**FOR SALE**—The library of the late J. Eugene Law is to be sold. Please send 4 cents in stamps for an itemized list.—MRS. LAURA B. LAW, Box 247, Altadena, Calif.

**FOR SALE**—In original covers, The Condor, vols. XVI to XXVIII, inclusive, complete except for vol. XXIII, no. 3, and vol. XXVII, nos. 4 and 5.—MRS. ROBERT FARGO, 1632½ N. Kingsley Drive, Hollywood, Calif.

**FOR EXCHANGE**—I have the following sets to exchange for ornithological books: Bonaparte Gull 1-3, Richardson Pigeon Hawk 1-5, Lesser Yellow-legs 1-4, Stilt Sandpiper 1-4, Semipalmated Plover 2-4, Least Sandpiper 1-4, Lapland Longspur 1-5, White-crowned Sparrow 1-5, all personally collected.—FRANK L. FARLEY, Camrose, Alberta.

**WANTED**—A copy of The Birds of Western Canada, by Taverner.—GEORGE M. BENSON, Voltage, Oregon.

**WANTED**—Auk: Vol. I, nos. 2, 3, 4; vol. II, nos. 1 and 4. Condor, any before 1904.—WILLIAM G. FARGO, 506 Union St., Jackson, Michigan.

**WANTED IN EXCHANGE**—One copy each of North American Amphibians and Reptiles, Stejneger and Barbour; and Reptiles of Western North America, Van Denburgh. Will give good exchange in specimens or publications on ornithology or mammalogy.—STANLEY G. JEWETT, 532 Bidwell Ave., Portland, Oregon.

**WANTED**—An old skin or mounted specimen of the California Condor, taken before the present law prohibiting the shooting of this bird went into effect. In answering advise date collected, condition and sex.—MILTON S. RAY, 2901 Broadway, San Francisco, Calif.

**WANTED**—Lists of duplicates: books, magazines, or bulletins on natural science, especially on birds and mammals. I am in the market for many items not already included in my library.—JOHNSON A. NEFF, Bureau of Biological Survey, Marysville, California.

**FOR SALE**—The Condor: Vol. XVI, 1914, complete; vol. XVII, 1915, complete; vol. XXI, 1919, no. 3; vol. XXIII, 1921, no. 5; vol. XXX, 1928, no. 5; vol. XXXI, 1929, nos. 1, 3, 5 and 6; vol. XXXII, 1930, complete.—MARIE A. COMMONS, Tanager Hill, Crystal Bay, Minnesota.

**WANTED**—The Condor: Vols. 1 to 32, inclusive; Bird-Lore: Vols. 1 to 23, inclusive; The Auk: Vols. 1 to 41, inclusive; The Wilson Bulletin: Vols. 1 to 39, inclusive; The Oologist: Vols. 1 to 38, and nos. 1 to 7 of vol. 41; Bulletin of Northeastern Bird Banding Association: No. 4 of vol. 2; Bird Banding Notes: Nos. 1, 5 and 11.—LONY B. STRABALA, Leetonia, Ohio.

## WESTERN BIRD-BANDING ASSOCIATION

### Recommends and Supplies

|   |  |                     |
|---|--|---------------------|
| The new W.B.B.A. Two-compartment Trap; in the United States, west of Mississippi River.....     |  | \$1.50 postpaid     |
| East of the river, and in Canada.....   |  | \$1.75 postpaid     |
| With bottom, as gathering cage, add.....  |  | \$0.25 postpaid     |
| The new W.B.B.A. Water (Warbler) Trap; in the United States, west of the Mississippi River..... |  | \$3.00 postpaid     |
| East of the river, and in Canada.....   |  | \$3.25 postpaid     |
| Four-compartment Folding Potter Trap.....   |  | \$4.00 postpaid     |
| Hoffmann's Birds of the Pacific States.....   |  | \$5.00 plus postage |

WESTERN BIRD-BANDING ASSOCIATION, Museum of Vertebrate Zoology, Berkeley, California

